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ABSTRACT

This packet of learning activities covers laboratory safety, hazard alert messages, and various shop tools for students in grades 6-10. It contains a technology education overview, information on using the instructor's and student's sections, information on measuring student performance gains, and the instructor's and student's sections. The overview discusses the technology education program and materials. Components and graphics are described next. Specific information on measuring student performance gains follows. The instructor's section contains the following: background information; suggested activities; a list of suggested resources; supplemental activities (resources, tools and materials, challenge, evaluation); written tests; test answers; and bibliography. The student's section consists of 10 design briefs. Components of each brief are as follows: a summary of activities; assignments to turn in; goal; vocabulary; safety rules; objectives (instructions, tools and materials, procedure); and academic and workplace applications. The written tests conclude the packet. (YLB)

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ED 380 602

Technology Learning Activity

Technology Education Series

SAFETY DESIGN BRIEFS

TLA TE-1107

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CIMC

Teacher Edition

Oklahoma Department of
Vocational and Technical Education
1500 West Seventh Avenue
Stillwater, OK 74074-4364

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE1107

Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

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FOREWORD

What will be the careers of the future? The workforce of tomorrow will be shaped by the technologies being developed today. Students today need accurate, interesting information on growing technologies in order to make informed decisions about their futures.

It is our hope that this curriculum will help improve the quality of career decisions for our students. Students are introduced to a wide range of current, "cutting-edge" technologies and are encouraged to think critically about how those technologies influence their lives and futures. Today's students do not have to become the victims of "technological illiteracy," but instead can learn to anticipate technological developments and take positive steps to prepare for the future.

Technology Learning Activities and Design Briefs provide students with the knowledge and an introduction to the skills they need for a positive learning and career experience. Every generation is faced with learning how to manage technological advances. Information gained through participation in the *Technology Education* program can help students develop a holistic view of technology on which to base their educational and career decisions.

Roy Peters, Jr., Ed.D., State Director
Oklahoma Department of
Vocational and Technical Education

Lynn Hawkins, State Supervisor
Technology Education
Oklahoma Department of
Vocational and Technical Education

PREFACE

We believe that one of the most effective ways to improve education is through the development and implementation of a sound instructional materials system. Technology Education instructional materials represent a new design for CIMC which recognizes the importance of graphic materials in the learning process.

Technology Education instructional materials are designed for 6th through 10th grade students. The design of these materials is based on current research on how people read and gain information from documents. The design is called "New Look" and integrates both graphics and text into a balanced presentation which is easy to use and follow. This publication also uses the design brief format, in which some activities provide students with challenges instead of step-by-step instructions.

Technology Education provides the student a look at what the world will be like in the future based on technologies in use and being developed today. Throughout the Technology Education instructional materials, the students are introduced to "cutting-edge" technologies that they will use and encounter in a working environment later in life. This exposure gives them a wide range of experiences on which to base career decisions.

This publication is intended as a starting point, from which the teacher can innovate, localize, and personalize in order to prepare students for their future. The *Technology Education* series of Technology Learning Activities and Design Briefs was written with the realization that we are creating the workforce of tomorrow by how and what we teach about technology today.

Sherry Wietelman, Curriculum Development Specialist
Curriculum and Instructional Materials Center

Tracy Boyington, Technical Writer
Curriculum and Instructional Materials Center

ACKNOWLEDGEMENTS

The Curriculum and Instructional Materials Center (CIMC) extends its appreciation to those individuals who played important roles in the development of Technology Learning Activity materials.

We also thank the State Director, Dr. Roy Peters, Jr., and the Assistant State Director, Dr. Charles O. Hopkins, for their continued support throughout this project.

Oklahoma Department of Vocational and Technical Education Technology Education staff who provided leadership and direction on this project also deserve special recognition.

Lynn Hawkins
State Supervisor
Technology Education

Donovan Bowers
Assistant State Supervisor
Technology Education

Harold Holley
Assistant State Supervisor
Technology Education

Special recognition and thanks are expressed to CIMC technical writer Tracy Boyington, who helped create the Design Brief format.

Only through the close cooperation of the Curriculum and Instructional Materials Center staff was this curriculum developed. Sincere thanks are shared with the CIMC coordinators.

John Friedemann
CIMC Coordinator

Lynna Ausburn, Ph.D.
CIMC Development Coordinator

Special recognition and thanks are also extended to other individuals within the Oklahoma Department of Vocational and Technical Education (ODVTE) involved in the development and distribution process: Noel Wilcoxson, Danny Darrow, Diane Ensign and their staffs at the ODVTE Print Shop; Bob Davis and staff artist Kathryn Moore for the cover design; Darrel Stiles and his staff in the ODVTE Warehouse for packaging and coordinating transportation and distribution of these materials; and the CIMC Word Processing team of Brenna Tillman and Charlotte Tarkington.

Finally, a big thank you to all ODVTE team members who offer their support on a daily basis in "behind-the-scenes" ways but never seem to be recognized for their contributions: Suzanne Perry and Terri Tomson, CIMC secretaries; Shirley Hill, Technology Education secretary.

Sherry Wietelman, M.S.
Curriculum Development Specialist
Curriculum and Instructional Materials Center
Oklahoma Department of Vocational and Technical Education

TECHNOLOGY EDUCATION OVERVIEW

About the Program

Because the American culture is distinctly characterized as technological, it becomes the function of our schools to give every student an insight into and an understanding of the technological nature of the culture. Technology Education strives to perform this function.

Technology Education in Oklahoma is an instructional program that provides young men and women (grades 6 - 10) with daily, hands-on exploratory experiences and insights into technology and career opportunities so that they can make meaningful occupational and educational choices. It is a program which can enhance the educational experience of all students, whether they are the valedictorian/honor-type student, the middle range/average student, or the student who has found little success in school, namely the at-risk student.

Technology Education acquaints all students with their technological environment so they can make rational decisions about their own lives on a day-to-day basis and participate in controlling their own destiny. The program directs students to related technological and industrial fields, enabling students to realize their full potential and make maximum use of their individual talents in fulfilling career goals in their selected areas of employment.

Technology education capitalizes on the individual's potential for reasoning and problem solving, for imagining and creating, and for constructing and expressing through the use of tools and materials related to technology. It develops content and experiences to contribute to the growth and development of students commensurate with

TECHNOLOGY EDUCATION OVERVIEW

their potential. Thus, Technology Education is a basic and fundamental study for all persons in regard to career explorations and educational opportunities.

Opportunities to develop and apply leadership, social, civic, and technologically related skills are provided through the Technology Student Association (TSA). TSA is the appropriate vocational student organization identified as a teaching tool for teachers to use in assisting students to achieve identified course competencies. Competency-based activities are an integral part of the instructional program.

All Technology Education courses are taught in a one-period block of time (45-55 minutes), with each of the four Technology systems (communication, construction, manufacturing, and transportation, energy and power) being designed to provide a means through which other courses such as math, science, English, and social studies can be applied in a practical manner within a technology-based situation. Teaching across the curriculum is vital to the success of a Technology Education program.

TECHNOLOGY EDUCATION OVERVIEW

Design Briefs

The Safety Design Briefs are a set of activities that cover laboratory safety, hazard alert messages, and various shop tools. Each design brief stresses safety, both in general practice and in the use of each specific tool. Unlike the TLAs, Design Briefs are not intended to take a specific number of days to complete.

The *Technology Education* Series

The *Technology Education* series consists of 40 Technology Learning Activities (TLAs) and Design Briefs for instruction and a supplemental activities book. Each is divided into two parts: an instructor's guide and a student guide. The instructor's guide provides an overview of Technology Education, a summary of activities and supplies needed for students to complete the Technology Learning Activity/Design Brief, a supplies and materials worksheet for the instructor, an overview of the particular TLA/Design Brief, written exam answer sheets, and evaluation summary for the TLAs.

All of the TLAs and Design Briefs focus on measurable and observable learning outcomes. Instructors are encouraged to supplement, personalize, localize, and motivate with these materials in order to develop a complete teaching/learning process.

Each TLA and Design Brief is based on performance objectives. Performance objectives are specific, stating the performances necessary to meet the goal of the activity.

TECHNOLOGY EDUCATION OVERVIEW

To Order Materials

TLAs and Design Briefs in the *Technology Education* series may be ordered through the Oklahoma State Department of Vocational and Technical Education, Curriculum and Instructional Materials Center, 1500 West Seventh Avenue, Stillwater, OK 74074-4364. Phone 1-800-522-5810.

NOTE: The 1100- and 1200-series numbers given on the next page are for ordering Instructor's Editions; to order Student Editions, change the first two numbers to 31 (for 8-Day TLAs) or 32 (for 6-Week TLAs).

Disclaimer

The materials and information contained in this publication have been gathered from sources believed to be reliable and to represent current opinion on the subject of safety in the school technology laboratory. No warranty or guarantee is made by the Oklahoma Department of Vocational and Technical Education or other contributors as to the absolute correctness or sufficiency of any material contained in this manual. The Oklahoma Department of Vocational and Technical Education and contributors assume no responsibility in connection herewith; and it cannot be assumed that all safety measures are contained in this manual, or that additional measures may not be required under particular or exceptional circumstances.

TECHNOLOGY EDUCATION OVERVIEW

TLA Title	Order No.
8-DAY TLAs	
Aerospace and Flight	TE1117
Agricultural Education	TE1123
Audiovisual Programming	TE1131
CAD — Autocad Release 10	TE1114
Career Search	TE1104
Drafting	TE1134
Electricity — Principles and Applications	TE1105
Electronic Publishing	TE1135
Electronics (CES)	TE1106
Fluidics Technology	TE1116
Health Occupations	TE1124
Home Economics	TE1125
Introduction to VoTech	TE1122
Introduction to Animation	TE1132
Keyboarding and Computer Application	TE1115
Laser/Fiber Optics/Holography	TE1129
Lasers Technology	TE1103
Marketing Education	TE1126
Material Processes — Plastics	TE1133
NASA Aerospace-Spacelink	TE1111
Photography	TE1130
Problem Solving	TE1110
Research and Design	TE1101
Residential Construction	TE1121
Robotics — Control Technology	TE1112
Robotics — ProArm	TE1113
Safety (Design Briefs)	TE1107
Structural Engineering	TE1102
Synergetic Technology	TE1120
Technical Report Writing	TE1118
Technology Challenge	TE1109
Thermal Screen Printing	TE1119
Trade and Industrial Education	TE1127
TSA Leadership	TE1108
Vocational Business	TE1128
6-WEEK TLAs	
Animator	TE1203
CAD/Board Drafting	TE1201
Control Technology	TE1202
Electronics/Electricity/Robotics	TE1204
Electronic Publisher	TE1205

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TECHNOLOGY EDUCATION OVERVIEW

Corrections and Suggestions

CIMC wants to provide Technology Education instructors and students materials that are accurate and effective. Although the CIMC strives to maintain the highest standards of development and production, oversights occasionally do occur. If you find any errors in this or other CIMC publications or have suggestions for improving their usefulness, please notify the CIMC staff. One easy way of pointing out errors is to make a photocopy of the affected page and indicate the correction on the copy. Mail this information to the CIMC, where it will be used to correct the publication before the materials are reprinted.

To ensure that the material is updated on a timely basis, notify the CIMC of necessary corrections as soon as possible. Do not assume that someone else will notice the error and inform the CIMC; other users may be making the same assumption. Please send corrections and recommendations for improving this publication to the following address:

Curriculum Development Coordinator
Curriculum and Instructional Materials Center
Oklahoma Department of Vocational and
Technical Education
1500 West Seventh Avenue
Stillwater, Oklahoma 74074-4364

USING THIS PUBLICATION

INSTRUCTOR'S SECTION

Expected Learner Outcomes

There are 19 Expected Learner Outcomes for the *Technology Education* series. Not every TLA or Design Brief fulfills all 19 Expected Learner Outcomes. Outcomes specific to the Design Briefs are listed below.

- The student will come to know and appreciate the importance of Technology and technological literacy.
- The student will develop basic skills in the safe and proper use of tools, machines, materials, processes, and technical concepts.
- The student will think logically and sequentially.
- The student will become a more sophisticated consumer of the goods and services of a technological society.

Suggested Activities

The purpose of the suggested activities component is to assist during the preparation stage of the teaching/learning process. The activities provide suggestions for preparation and evaluation during the instructional process. The instructor should read the suggested activities before assigning the Design Briefs to allow time to obtain supplemental materials, prepare audiovisual materials, and contact outside resource persons. Duties of the instructor will vary according to the particular Design Brief.

USING THIS PUBLICATION

INSTRUCTOR'S SECTION

Suggested Resources

Suggested resources include people and media (print and non-print) that may be used with the Design Brief. References used during the development of each Design Brief are also provided. Instructors can use suggested resources and references to supplement their knowledge of the subject to help students with particular interests or objectives in the area covered. Please note that suggested resources and references listed in this publication existed when this publication was written. CIMC assumes no responsibility for providing these materials and cannot guarantee the availability of these materials as individual vendors, manufacturers, and publishers may discontinue these products at any time.

Supplemental Activities

Supplemental Activities are additional activities to be used at the instructor's discretion to enhance the learning experience. These activities are based on TSA competitive events.

Equipment, Tools, and Supplies: Summary Worksheet

This component is provided as a planning tool for instructors. It provides instructors with a list of the necessary equipment, tools and supplies to support student activities and provides specific information for budgeting purposes.

USING THIS PUBLICATION

INSTRUCTOR'S SECTION

Pretest	The Pretest provides a basis for measuring student performance gains. Because the Pretest is identical to the Posttest, student gains can be measured accurately. The Pretest should be used only for calculating student gains, not for grading students.
Posttest	This component provides a criterion-referenced evaluation of the objectives listed in each Design Brief. If objectives or activities have been added, deleted, or modified, appropriate changes should be made on the tests. **Students must score 100% on the final written test.**
Test Answers	This component is provided to assist instructors in evaluating student performance on written tests. Only one set of answers is provided. The question numbers correspond to Pretest question numbers, but pretests and posttests are identical for each Design Brief.

USING THIS PUBLICATION	STUDENT'S SECTION
Introduction	Each Design Brief is organized by tasks and activities students will complete to achieve the learning experience. The following components are common to all Safety Design Briefs.
Summary of Activities	Each Design Brief contains a Summary of Activities page. This page provides several important pieces of information for both the student and instructor. ❶ In the left column, the activities the student must accomplish are listed. ❷ In the right column, the major Academic and Workplace Application which applies to the Design Brief activities is graphically indicated with a standard icon. ❸ Below the icon is a list of specific skills reinforced in the Design Brief activities.
Pretest Instructions	The students are required to take a Pretest as one of the first activities. The instructions for the Pretest are given in this section.
Assignments to Turn In	This component provides a list of all assignments the student must turn in to the instructor after completing the Design Brief.

USING THIS PUBLICATION	STUDENT'S SECTION
Goal	The Goal is a concise statement of the overall goal of the Design Brief. This statement summarizes the purpose for completing the Design Brief and encourages the student to think about the broader implications of the learning experience.
Words You Should Know	Most Design Briefs include a glossary of unfamiliar technical terms. Often these terms are necessary for the student in order to accurately follow instructions in the activity procedures. The students should be encouraged to review this glossary and refer to it often during the course of the Design Brief.
Objectives	Each Design Brief is made up of a set of measurable objectives. In this section, students are given a list of all the objectives addressed in the Design Brief.
Academic and Workplace Applications	The curricular content and activities found in this Design Brief help students apply academic and workplace competencies. These competencies include: Reading Skills, Writing Skills, Mathematics Skills, Science Skills, Oral Communications Skills, Interpersonal or Relating Skills, Creative Thinking and Problem Solving Skills, Employability Skills, and Social Studies Skills.

USING THIS PUBLICATION

STUDENT'S SECTION

Preparing students to enter successfully into today's world ...

Preparing students to enter successfully into today's world of work offers vocational education a substantial challenge. The contemporary workplace is characterized by constant and rapid technological change and by increasing job complexity and skill intensity. Due to rapid technological advancement, the half-life of work skills is now reduced to a bare three to five years. Out of this new workplace environment has arisen a growing national awareness of the critical importance of an American workforce armed with the skills necessary to survive in a competitive economy.

... emergence of a renewed emphasis on basic academic skills ...

One result of this national awareness has been the emergence of a renewed emphasis on basic academic skills in all areas of education. Pressure to increase academic skill development is being placed on education by both legislative action and industry mandate. The Carl D. Perkins Vocational and Applied Technology Education Act of 1990 sets stringent academic and workplace skill requirements for vocational education. State legislatures are increasingly requiring basic skills accountability by teachers and school administrators.

... expected learner outcomes are being implemented with increasing frequency.

Graduation exams, minimum competency requirements, and expected learner outcomes are being implemented with increasing frequency. In addition, business and industry are delivering the message clearly to educators that vocational competence now requires increased strength in academic and workplace skills.

USING THIS PUBLICATION

The issue of basic skills ... was successfully addressed in a national three-year study ...

... research indicates clearly that American employers ... need a variety of skills ...

... business and industry have expanded and re-defined "workplace basics."

STUDENT'S SECTION

The issue of the basic skills currently required in the work place was very successfully addressed in a national three-year study conducted jointly by the American Society of Training and Development (ASTD) and the U.S. Department of Labor (DOL). The findings of this study were published in 1990 in the book, *Workplace Basics: The Essential Skills Employers Want.*

The ASTD/DOL research indicates clearly that American employers have discovered that their workforces need a variety of skills that include, but are not limited to, the classic academic trio of reading, writing, and computation. Employers now are also looking for competence in areas such as "learning to learn," problem solving and critical thinking, interpersonal and teamwork skills, oral communication and listening techniques, and the social and personal management skills that demonstrate a capacity for independence and responsibility in on-the-job performance.

It is clear that the requirements of today's business and industry have expanded and re-defined "workplace basics." It is in line with this re-definition, and with the competency requirements of current education legislation, that the Oklahoma Department of Vocational and Technical Education has chosen to address "basic skills" in the instructional materials produced by its Curriculum and Instructional Materials Center.

USING THIS PUBLICATION

CIMC materials contain information and activities which develop academic and workplace application competencies ...

To assist teachers and students in identifying activities which promote academic and workplace skills ...

STUDENT'S SECTION

It is not a new development for CIMC materials to contain information and activities which develop academic and workplace application competencies in students undertaking vocational programs. What is new is the specific marking, or flagging, of items in our instructional materials that address academic and workplace application skills.

To assist teachers and students in identifying activities which promote academic and workplace skills development, CIMC has implemented a marking system which uses simple graphic symbols, or icons. These icons are located in the right margins of Activity Sheets. The following is an explanation of the icons and the kinds of academic and workplace application activities they indicate.

USING THIS PUBLICATION

READING SKILLS: Skills involving use of print resource material for obtaining and applying information.

WRITING SKILLS: Skills involving written communication of processes, information, or ideas.

MATHEMATICS SKILLS: Skills involving computation, calculation, and interpretation of numerical data.

STUDENT'S SECTION

Current vocational education literature indicates that functional literacy as a workplace basic needs to be defined in terms of reading competencies actually required for job performance. The activities identified with this icon as addressing reading skills in CIMC materials deal specifically with developing reading skills in an applied, job-related context. These range from general information-gathering activities to tasks requiring use of specific technical reference materials. Many contain a "learning to learn" aspect, which promotes engaging actively and purposefully in vocationally relevant enquiry.

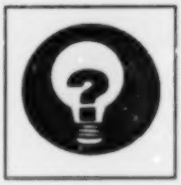
Tasks identified with this icon promote development of skills in written communications. As with reading skills, the writing skills emphasized in CIMC materials have a vocational context. They include filling out forms, keeping work activity records, writing simple memos and letters, generating more complex reports and articles, and written expression of ideas and concepts related to vocational performance or exploration.

This icon identifies activities which develop vocationally-related skills in computation, measurement and estimation, selection and application of appropriate mathematical processes, and collecting, displaying, or interpreting data.

USING THIS PUBLICATION	STUDENT'S SECTION
SCIENCE SKILLS: Skills involving mastery and application of scientific information or theory.	This icon marks activities which are related to the development of skills in either the physical or biological sciences. These skills stress occupationally-related applications of science and technology.
ORAL COMMUNICATION SKILLS: Skills involving speaking and listening.	Activities marked with this icon promote development of effective speaking and listening. They include practice in such areas as speaking techniques, word choice, non-verbal messages, use of communication media, and using active listening techniques. Many of these activities promote "learning to learn" skills in verbal enquiry.
INTERPERSONAL OR RELATING SKILLS: Skills involving working and getting along with others.	Activities which deal directly with skills in relating to others are marked with this icon. This includes areas such as multi-cultural awareness, group processes and dynamics, negotiation, dealing with conflict, cooperation and teamwork, values and attitudes, and leadership and motivation.

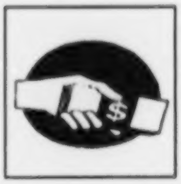
USING THIS PUBLICATION

STUDENT'S SECTION



CREATIVE THINKING AND PROBLEM SOLVING SKILLS: Skills involving comprehending, applying, analyzing, and developing complex ideas and situations.

This icon identifies activities which stress development of higher-order thought processes such as problem identification and analysis, lateral thinking, evaluating alternatives, developing solutions, examining assumptions, and evaluating outcomes.



EMPLOYABILITY SKILLS: Skills involving choosing, obtaining, and succeeding in a career.

Activities marked with this icon relate to competencies required to obtain employment and develop a career. These competencies include specific occupational tasks. They also include items such as career analysis and selection, job searching, completing applications and resumes, interviewing, and business etiquette and personal management skills required for job-keeping and maturing in one's work. Examples of the latter category include personal presentation, self-discipline, work accuracy, reliability, discretion, punctuality, stress handling, judgement, confidence, etc.

USING THIS PUBLICATION

STUDENT'S SECTION

SOCIAL STUDIES SKILLS: Skills involving investigation and application of social concepts.

This icon marks activities which stress competencies in fields relating to human society and its distribution and relationships. This includes areas such as history, geography, government and politics, economics, psychology, sociology, demographics, current events, cross-cultural studies, consumer issues, environmental issues, and ethical concerns in science and technology.

Posttest Instructions

The students are required to take a Posttest at the end of each Design Brief. The instructions for the Posttest are given in this section. The score for the Posttest may be compared to the score for the Pretest to help determine the student's gain during the Design Brief.

Hazard Alert Messages

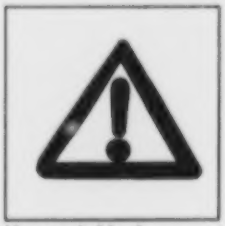
The Design Briefs include hazard alert information specific to the activity. These messages should be discussed carefully and thoroughly. The Hazard Alert Message system used in the TLAs and Design Briefs is based on the American National Standards Institute (ANSI) Standard Z535, which provides for five levels of alert.

Students are introduced to the ANSI Hazard Alert Message system in the Laboratory Safety section of the Safety Design Briefs. This system was adopted by ANSI as the standard in 1990 and will be the hazard alert system in use when students reach the workplace.

USING THIS PUBLICATION

STUDENT'S SECTION

Hazard Alert Messages in the TLAs and Design Briefs are indicated both by the color red and graphically. There are three types of hazard alert graphics:



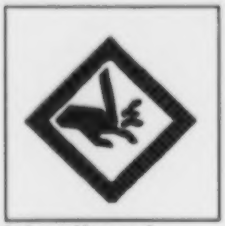
Hazard Alert Symbol

This Hazard Alert Symbol is used with the words DANGER, WARNING, and CAUTION. ANSI defines these words as:

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

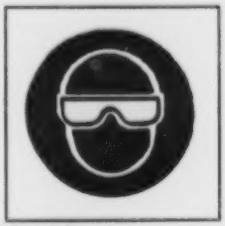
CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.



Injury Hazard Graphic

There are two types of graphics used in conjunction with the hazard alert symbol. This type of graphic depicts a specific injury that may be expected if the hazard described in the alert is not avoided.

USING THIS PUBLICATION



Avoidance Graphic

STUDENT'S SECTION

This second type of graphic is called an avoidance graphic. It depicts an action the student should take in order to avoid injury.

There are two other ANSI words used in the Technology Education materials and the students should understand their meanings:

NOTICE indicates an action that could result in damage to property or equipment.

IMPORTANT indicates an instruction that can help the student do a better job.

USING THIS PUBLICATION

MEASURING STUDENT PERFORMANCE GAINS

Using the Pretest and Posttest to Measure Student Performance Gains

When you examine this book, you will notice that the pretests and posttests are identical. The reason for using a single instrument as both pretest and posttest is so that direct comparison of each student's competencies before and after instruction can be made accurately. This comparison enables precise calculation, documentation, and evaluation of student performance gains.

Accurate performance gains analysis is an important requirement of the new Carl Perkins legislation for vocational education. Teachers can make an important contribution to the performance accountability mandated by the new federal legislation by carrying out accurate performance gains analysis for their students, and making this data available to students, parents, and administrators.

This analysis is easy to do and requires only simple calculations and record keeping. The new CIMC unit tests and the instructions given here for pretest/posttest analysis are designed to help teachers keep accurate performance gains data with minimum effort.

Identical Pretest and Posttest

It is only possible to calculate a gain in performance if competencies are tested both before and after training. The use of a pretest and a posttest gives the required "before and after" information, allowing accurate comparison of student performance before and after completing a program of instruction.

MEASURING STUDENT PERFORMANCE GAINS

Without pretest data, it is impossible to determine how well students could have met the objectives of a program without the benefit of any instruction. It would therefore be quite possible to incorrectly interpret good student performance on a posttest as gains in ability and knowledge produced by a good instructional program when, in fact, the posttest strength might be due merely to prior knowledge on the part of students. This erroneous conclusion is avoided by use of both pretest and posttest data.

If students cannot meet the objectives of a program prior to instruction but can meet them afterward, the conclusions that performance gain has been made, and made as a result of instruction, are much more likely to be accurate.

In order to provide data which can be precisely compared, the pretest and posttest **must be identical.** This is why Technology Education materials have identical pretests and posttests for each unit.

After giving the written test to all students both before and after you present a unit, you will be ready to make the calculations needed for your analysis of your students' performance gains on the unit. There are two techniques you should use for this analysis.

Analyzing Performance Gains for Groups of Students

The first step to measuring student performance gains on a unit is to examine the gains made by an **entire class or other group.**

MEASURING STUDENT PERFORMANCE GAINS

The simplest technique for showing posttest gains for a group is to calculate **pass rates** on the unit test. Pass rates are very easy to calculate, and require a minimum of computation.

Pass rates are simple percentages; specifically, the percentage of students who answered each test question correctly.

Matching Test Questions to Objectives

To determine pass rates, the first step is to match each question on the test to a specific objective. This is easy with CIMC instructional materials, because they have clearly specified objectives.

As an example of matching test questions to objectives, look at the chart below. Here, a teacher has decided that test questions 1 and 4 test objective number 1; question 3 tests objective number 2; and test question number 2 tests objective number 3.

Objective number	Test Question Number
1	1
1	4
2	3
3	2

USING THIS PUBLICATION

MEASURING STUDENT PERFORMANCE GAINS

Calculating Pass Rates

After you have carefully cross-matched test questions and objectives, you are ready to proceed with the calculation of pass rates. You will determine a rate for **each test question**. Calculate pass rates with this simple formula:

$$\frac{\text{Number of students who passed the question}}{\text{Number of students in group}} \times 100 = \text{Pass Rate (\% of the group that passed the question)}$$

Keep in mind that pass rates examine the performance of a **group**. They do **not** provide information about individual students.

Using a Pass Rate Chart

The best way to record, display, and analyze pass rates is in a **Pass Rate Chart**. The chart puts all data in uniform and easily read format and simplifies data analysis. The chart should include pass rates for the group on both pretest and posttest for all test questions, and should indicate which specific questions relate to each objective. It should also show pass rates for the entire test as a whole.

USING THIS PUBLICATION

Completing a Pass Rate Chart

MEASURING STUDENT PERFORMANCE GAINS

Below is an example of a completed Pass Rate Chart.

Objective Number	Test Question Number	PRETEST PASS RATE	POSTTEST PASS RATE
1	1	0%	100%
1	4	2%	82%
2	3	0%	60%
3	2	4%	92%
TOTAL TEST RATES		100-90% 0% 89-80% 0% 79-70% 0% 69-60% 0% 59-50% 0% 49- 0% 99%	100-90% 60% 89-80% 20% 79-70% 10% 69-60% 5% 59-50% 5% 49-0% 0%

By looking at the figures on the chart, you can easily see how great a difference in performance there is for the class before and after instruction. You can also see which specific objectives and/or test questions caused problems for students. The differences between pretest and posttest pass rates represent performance gains for the group of students.

To complete a Pass Rate Chart, you need to go through a simple sequence of steps and record the information on the chart. A blank Pass Rate Chart is presented on page 36. You may duplicate this chart for your personal use.

USING THIS PUBLICATION

MEASURING STUDENT PERFORMANCE GAINS

To complete a Pass Rate Chart for a Design Brief, TLA, or other CIMC unit of instruction, go through the following steps:

1. Match the test questions on the written test to specific objectives, and fill in the first two columns on the left. These columns are labeled "Objective Number" and "Test Question Number." Some objectives may have more than one test question matched to them.

2. Give the pretest, then calculate the pass rate for each test question using the formula given on page 28. Record the pass rate for each test question in the "Pretest Pass Rate" column.

   EXAMPLE:
   In a class of 26 students, 3 students got a question correct. Pass rate for the question = (3 ÷ 26) X 100, or 11.5%.

3. Calculate the total test pass rates for the pretest and fill in these rates at the bottom of the "Pretest Pass Rate" column. Do this as follows:

   a. Calculate the percentage score made by each student on the pretest, using this formula:

$$\frac{\text{Number of points scored by student}}{\text{Number of points on the test}} \times 100 = \text{Percentage Score}$$

MEASURING STUDENT PERFORMANCE GAINS

EXAMPLE:
A student earns 6 points out of a total of 75 possible on the test. The student's percentage score is (6 ÷ 75) X 100, or 8%.

b. Determine how many students earned percentage scores in each of the following score ranges:

100-90%
89-80%
79-70%
69-60%
59-50%
40-0%

c. Change the number of students in each score range into a percent of the total group, using the following formula:

$$\frac{\text{Number of students who scored in an interval}}{\text{Total number of students in group}} \times 100$$

EXAMPLE:
In a group of 32 students, 12 students scored in the interval of 59-50%. The percent of students who scored in this interval is (12 ÷ 32) X 100, or 37.5%.

MEASURING STUDENT PERFORMANCE GAINS

4. Give the posttest, then repeat steps 2 and 3 above. Fill in the appropriate figures in the "Posttest Pass Rate" column for each test question, and for the total test rates.

Analyzing Performance Gains for Individual Students

After completing the Pass Rate Chart to analyze the performance gains for an **entire group** of students on a test, it is a good idea to calculate a measure of performance gains for **each individual** student. A simple and accurate way to do this is to calculate a **modified percentage gain score** for each student.

The modified percentage gain score for each student should be recorded in a **Modified Gain Record Chart.** This chart makes an easy reference for evaluating the gain performance of each student. A blank Modified Gain Record Chart appears on page 37. You may duplicate this chart for your personal use.

Calculating Modified Percentage Gain Scores

Modified percentage gain scores can be calculated at the top of each student's test paper. Calculate gain scores as follows:

1. Calculate the student's **Pretest Percentage**, or the percentage score the student made on the pretest. Use this formula:

$$\frac{\text{Number of points scored by student}}{\text{Number of points on the test}} \times 100$$

MEASURING STUDENT PERFORMANCE GAINS

2. Subtract this percentage from 100%. The resulting figure is the **Percentage Available** to the student for improvement on the posttest.

3. Calculate the **Posttest Percentage**, or percentage score the student made on the posttest, using the formula given in step 1.

4. Subtract the **Pretest Percentage** from the **Posttest Percentage**. This figure is the **Percentage Gained** on the posttest.

5. Divide the **Percentage Gained** (step 4) by the **Percentage Available** for gain (step 2). This figure is the ***Modified Percentage Gain.*** It shows what portion of the increase that was **possible** after the pretest was **actually gained** by the student on the posttest.

EXAMPLE:
As an example of the calculation of modified percentage gain scores, suppose a student made 10% on the pretest and 90% on the posttest. The calculation would be as follows:

1. The **Pretest Percentage** score of 10% was determined using the percentage formula given in step 1 on page 32.

MEASURING STUDENT PERFORMANCE GAINS

2. **Percentage Available** to the student for improvement on the posttest:

100%	
- 10%	(Pretest Percentage)
90%	(Percentage Available)

3. The **Posttest Percentage** of 90% was determined using the percentage formula.

4. **Percentage Gained** on the posttest:

90%	(Posttest Percentage)
- 10%	(Pretest Percentage)
80%	(Percentage Gained on posttest)

5. The **Modified Percentage Gain** score:

80% (Percentage Gained)
÷ 90% (Percentage Available) X 100 = 89%

This student made a modified gain score of 89%. That means that the student earned 89% of the improvement that was possible for him/her on the posttest, based on his/her pretest score.

Using a Modified Gain Record Chart

A modified percentage gain score should be calculated for each student on each unit test. Enter the gain scores on a Modified Gains Record Chart like the one that is on page 37. (Copy this form for your own use.) By using these forms, you can easily check through the gain scores and analyze the performance gains made by your students on each unit of instruction.

If most students have made good performance gains from your instructional program, there will be a large number of high modified gain scores. This would indicate that your students are gaining from your program **most** of what they did not know before they received instruction.

In conclusion, the procedures you have learned for measuring student gains are based on:

- giving **pretests and posttests** which are identical
- calculating and analyzing **group pass rates** for learning objectives, for individual test questions, and for entire unit tests (Complete a Pass Rate Chart for each unit)
- calculating and analyzing **students' modified percentage gain scores** to determine their individual performance improvement (Complete a Modified Gain Record Chart for each unit)

By using these basic procedures you will gain accurate and objective information about what specific skills your students are mastering and how much they are improving as they proceed through your program. This information will be very valuable in documenting your students' achievement gains, and in increasing accountability to students, parents, administrators, and government.

PASS RATE CHART

CLASS ____________________________

TEST/UNIT TITLE ____________________________

TEST DATE ____________________________

OBJECTIVE NUMBER	TEST QUESTION NUMBER	PRETEST PASS RATE	POSTTEST PASS RATE
TOTAL TEST PASS RATES		100-90% ___% 89-80% ___% 79-70% ___% 69-60% ___% 59-50% ___% 49-0% ___%	100-90% ___% 89-80% ___% 79-70% ___% 69-60% ___% 59-50% ___% 49-0% ___%

May be photocopied for instructor's use

MODIFIED GAIN RECORD CHART

CLASS ____________________

TEST/UNIT TITLE ____________________

TEST DATE ____________________

STUDENT'S NAME	PRETEST PERCENTAGE	POSTTEST PERCENTAGE	MODIFIED PERCENTAGE GAIN

May be photocopied for instructor's use

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE1107

INSTRUCTOR'S SECTION

Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

BACKGROUND INFORMATION

Safety in the technology lab is the primary concern. Therefore, you should have all students complete the appropriate Safety Design Briefs with 100% accuracy before allowing them to use technology lab equipment. Students should first complete the *Laboratory Safety Design Brief,* then complete the Design Brief on each piece of equipment as they are ready to use it.

While in the Technology Education Lab, students will use many machines that must be used safely and only for their intended purposes. The machines range from traditional woodworking tools to advanced technical devices such as lasers. Through the introduction of proper and safe use of power tools, the Safety Design Briefs introduce students to concepts of safe operation that are applicable to a safe working environment in the technology lab.

One of the most important components of each Safety Design Brief is your demonstration of how to use the equipment safely.

NOTICE: Be sure you, the instructor, can safely and properly operate all equipment before demonstrating to students.

INSTRUCTOR'S SECTION

SUGGESTED ACTIVITIES

✓ Obtain materials to supplement Design Brief.

NOTE: See Suggested Resources for resources to supplement this module.

✓ Study the specific objectives to determine those you will cover in your presentation.

✓ Determine scope and sequence of objectives that you add to the Design Brief. Design and develop support materials, including evaluation techniques, for additional objectives.

✓ Determine how you will schedule time for students to demonstrate competence in the required procedures.

✓ Make sure all laboratory equipment has appropriate safety warnings and labels.

✓ Obtain or draw a simple floor plan of the Technology Lab for use in the Safety Map Challenge in Design Brief 1.

✓ Select products from the Technology Lab to add to the Chemical Safety Challenge in Design Brief 1.

INSTRUCTOR'S SECTION

PREPARATION

SUGGESTED ACTIVITIES

- ✓ Have students read and sign the Safety Pledge in Design Brief 1.
- ✓ Have students get their parents' signature on the Consent Form in Design Brief 1.

INSTRUCTOR'S SECTION

SUGGESTED RESOURCES

The following publications are available on a free loan basis from the Oklahoma Department of Vocational and Technical Education Resource Center, 1500 West Seventh Avenue, Stillwater, Oklahoma 74074.

Accident Prevention for Industrial Arts Vocational and Technical Education Programs. Stillwater, Oklahoma: Oklahoma Department of Vocational and Technical Education.

Safety on the Job: Some Guidelines for Working Safely. Stillwater, Oklahoma: Oklahoma Department of Vocational and Technical Education, 1989.

Safety on the Job: Fire Extinguishers (VHS, 23 minutes, 1988). Shows different classes of fires and fire extinguishers, explains the RACE acronym for dealing with fires (rescue, alarm, contain, extinguish), and shows how to use a fire extinguisher. Available on a free loan basis from the Oklahoma Department of Vocational and Technical Education Resource Center, 1500 West Seventh Avenue, Stillwater, Oklahoma 74074.

INSTRUCTOR'S SECTION

PUBLICATIONS

AUDIOVISUAL MATERIALS

SUGGESTED RESOURCES

The following videos are available from Shopware Educational Systems, 101 Hill Road, Aberdeen, WA 98520-7302, 1-800-487-3392. Each video covers the safe use of construction/woodworking equipment. A copyable quiz is included with each video.

Band Saw Safety
Disc & Belt Sanders Safety
Drill Press Safety
Jointer SafetyTable Saw Safety
Portable Drill Safety
Radial Arm Saw Safety
Router Safety
Scroll Saw Safety

INSTRUCTOR'S SECTION

SUPPLEMENTAL ACTIVITIES

INSTRUCTOR'S SECTION

RESOURCES

TSA Curricular Resources Guide, Technology Student Association, Reston, Virginia (use the guide effective for the current year).

TOOLS AND MATERIALS

- 11 X 17 posterboard, illustration board, cardboard, or foamboard
- Scratch paper
- Pencil
- Ruler
- Paint, colored pencils, and/or markers

CHALLENGE

Design and create a Safety Illustration to promote safety and safety practices.

EVALUATION

Illustration should conform to TSA rules and regulations.

SUPPLEMENTAL ACTIVITIES

INSTRUCTOR'S SECTION

RESOURCES

TSA Curricular Resources Guide, Technology Student Association, Reston, Virginia (use the guide effective for the current year).

TOOLS AND MATERIALS

- Video camera
- Videotape
- Stopwatch
- Paper, 8.5 X 11, 5 sheets
- Pencil or pen

CHALLENGE

Prepare a 30-second public service announcement and/or a 3 to 5 minute video promoting safety in the Technology Lab.

EVALUATION

Video should conform to TSA rules and regulations, with the following exceptions:

- Students may produce either a 30-second video, a 3- to 5-minute video, or both.
- The assigned topic will be *Safety in the Technology Lab.*

SUPPLEMENTAL ACTIVITIES	INSTRUCTOR'S SECTION
TSA Curricular Resources Guide, Technology Student Association, Reston, Virginia (use the guide effective for the current year).	RESOURCES
• Paper, 8.5 X 11, 10 sheets • Notecards, 3 X 5 or 4 X 6, 2 cards • Pen or pencil • Stopwatch	TOOLS AND MATERIALS
Prepare, memorize, and deliver a 3- to 5-minute speech on safety in the Technology Lab.	CHALLENGE
Speech should conform to TSA rules and regulations. The theme for the speech will be *Safety in the Technology Lab.*	EVALUATION

WRITTEN TESTS

1. When using electrical equipment, you must always stand:
    - a. At least 5 feet away from other students
    - b. Behind the equipment
    - c. On a dry floor
    - d. Where your instructor can see you

2. While in the Technology Lab, you should:
    - a. Clown around
    - b. Distract other students
    - c. Follow all safety rules
    - d. Play only harmless practical jokes

3. In the Technology Lab, you should stay away from:
    - a. Any area you are not working in
    - b. The darkroom
    - c. The welding area
    - d. The wood shop area

4. To dress correctly for the Technology Lab, you should:
    - a. Always wear gloves
    - b. Remove high-heeled shoes
    - c. Remove neckties, scarves, and jewelry
    - d. Wear only tennis shoes

INSTRUCTOR'S SECTION

TEST 1
DESIGN BRIEF 1: LABORATORY SAFETY

WRITTEN TESTS

5. Report any safety violations or unsafe working conditions to:

   a. The fire department
   b. Your instructor
   c. Your parents
   d. Your principal

6. Before you can use any equipment, you must:

   a. Ask your instructor for permission
   b. Be trained on how to use it
   c. Read the safety instructions
   d. All of the above

7. Never handle tools or equipment:

   a. That are plugged in
   b. That might be dangerous
   c. That you do not need to use for your activity
   d. Unless you or another student need to use them

8. When is it safe to lean on machines?

   a. Any time
   b. Never
   c. Only when no one is using them
   d. Only when performing maintenance

INSTRUCTOR'S SECTION

TEST 1 Continued

WRITTEN TESTS

9. At the end of the class period, you should:
   - a. Give all tools and materials back to your instructor
   - b. Leave tools and materials in your work area for the next student
   - c. Put tools and materials in your locker so you can use them tomorrow
   - d. Put tools and materials in their proper storage areas

10. When can you operate a piece of equipment with another student?
    - a. Never
    - b. To start or stop a machine in an emergency
    - c. When helping another student with a project
    - d. When two or more students need to use the same equipment

11. When should you practice correct safety procedures?
    - a. Always
    - b. When learning how to use a machine
    - c. When using a dangerous machine
    - d. When you are under pressure

INSTRUCTOR'S SECTION

TEST 1 Continued

WRITTEN TESTS

12. Never throw:

    a. Any tools or materials
    b. Pencils
    c. Power tools
    d. Sharp objects

13. When are you allowed to run in the Technology Lab?

    a. In an emergency
    b. Never
    c. When you are behind schedule
    d. When you are not using dangerous equipment

14. Which type of fire extinguisher would you use on an electrical fire?

    a. Class A
    b. Class B
    c. Class C
    d. Class D

INSTRUCTOR'S SECTION

TEST 1
Continued

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 1 Continued

15. Which of the following statements about protective equipment is true?

    a. Protective equipment is meant to protect you from all Technology Lab hazards.
    b. Students should wear protective equipment only when using dangerous tools.
    c. Wearing personal protective equipment is optional.
    d. Do not rely only on protective equipment to keep you safe.

16. Use a tool or piece of equipment only when:

    a. An instructor is watching you
    b. You use the tool for its specific purpose and the correct tool for the job
    c. It is unplugged
    d. Either you or the student you are working with knows how to use it

17. What should you do if you do not have the right kind of fire extinguisher for the fire you are trying to put out?

    a. Call for emergency help
    b. Look around for the proper type of fire extinguisher
    c. Look for other materials, such as water, to put out the fire
    d. Use the fire extinguisher you have available

WRITTEN TESTS

18. Hazardous materials should be stored:

    a. In approved safety containers
    b. In your locker
    c. Under your work table
    d. Where they are used the most often

19. In which of the following activities would you be likely to wear chemical goggles?

    a. Metal working
    b. Spray painting
    c. Woodworking
    d. Welding

20. Which type of fire extinguisher would you use on a trash can full of burning trash?

    a. Class A
    b. Class B
    c. Class C
    d. Class D

21. Before you complete each step in your activity, you should always:

    a. Ask your instructor for permission
    b. Ask another student who has already completed the activity to help you
    c. Cross off the previous step in your book
    d. Think through the step

INSTRUCTOR'S SECTION

TEST 1
Continued

WRITTEN TESTS

22. What is the correct way to cut with a craft knife?

    a. Pull it away from your body
    b. Pull it toward your body
    c. Push it away from your body
    d. Push it toward your body

23. What should you do with a craft knife when you have finished using it?

    a. Put it in a pencil cup with the blade end down
    b. Put the protective cap over the blade
    c. Remove the blade
    d. Stick the blade into a surface such as a cork board or cutting mat

24. What color is used to mark the operator's area around a piece of equipment?

    a. Blue
    b. Green
    c. Red
    d. Yellow

25. What color is used to signal the location of fire protection equipment?

    a. Blue
    b. Green
    c. Red
    d. Yellow

INSTRUCTOR'S SECTION

TEST 1
Continued

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 1 Continued

26. How should you test hot glue to see if it has melted?

    a. Look into the nozzle
    b. Squirt a small amount on a piece of scrap material
    c. Squirt a small amount on your finger
    d. Squirt a small amount on your project

27. You should read the label and safety warnings on packages of:

    a. All products
    b. Products you have never used before
    c. Products that could be dangerous
    d. Products with a skull and crossbones on the label

28. What should you do if you accidentally swallow a chemical you are using in the Technology Lab?

    a. Drink milk
    b. Make yourself vomit
    c. Read the package label and do what it says
    d. Take an antacid

WRITTEN TESTS

29. On equipment and in Design Briefs, the warning **DANGER** means that if you don't follow directions:

    a. You might get hurt
    b. You will probably get hurt and might get killed
    c. You might hurt someone else
    d. You might damage or destroy equipment

30. In the Design Briefs, **IMPORTANT** means that if you don't follow directions:

    a. You might get hurt
    b. You will probably get hurt and might get killed
    c. You might hurt someone else
    d. You might damage or destroy equipment

INSTRUCTOR'S SECTION

TEST 1
Continued

END OF TEST

WRITTEN TESTS

1. How close should the upper guard be to the stock?
    a. ½ inch above the stock
    b. ½ inch below the stock
    c. ¼ inch above the stock
    d. ¼ inch below the stock

2. To avoid injury if a blade breaks, always stand:
    a. In front of the saw
    b. Behind the saw
    c. On the left side of the saw
    d. On the right side of the saw

3. What should you do if you hear a clicking sound while the saw is moving?
    a. Continue cutting at high speed—this is normal
    b. Finish the cut at a slower speed and notify your instructor
    c. Remove scrap material from the saw blade with a stick, brush, or compressed air
    d. Turn off the saw, remove the stock after the blade comes to a complete stop, and notify your instructor

INSTRUCTOR'S SECTION

TEST 2
DESIGN BRIEF 2: BAND SAW

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 2 Continued

4. Correct dress for using the disc sander includes:

    a. Long hair kept tied back
    b. No ties, scarves, or jewelry
    c. Safety glasses or goggles
    d. All of the above

5. When is it safe to leave the band saw?

    a. As soon as you have turned off the machine
    b. When the machine has come to a complete stop
    c. When you are finished cutting
    d. When you have your instructor's permission

6. What should you use to remove scrap material from the saw blade?

    a. A stick or brush
    b. Compressed air
    c. Your hands
    d. All of the above

TEST 2
Continued

7. What should you do if a blade breaks?
    a. Quickly move to the left side of the machine to avoid injury
    b. Shut off power and back out after the machine comes to a stop
    c. Shut off power and stand away from the machine until it comes to a stop
    d. Wait for the machine to automatically come to a stop, then replace the blade

8. What should you do if the stock binds or pinches the blade?
    a. Quickly move to the left side of the machine to avoid injury
    b. Shut off power and back out after the machine stops
    c. Shut off power and stand away from the machine until it comes to a stop
    d. Wait for the machine to automatically come to a stop, then replace the blade

9. When can you adjust the upper and lower guides?
    a. When the blade is at full speed
    b. When the blade is moving slowly
    c. When the blade is stopped
    d. All of the above

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 2 Continued

10. What should you do after you make the last cut and turn off the machine?

    a. Allow the blade to coast to a stop
    b. Stop the blade with a push stick
    c. Stop the blade with a stick or brush
    d. Stop the blade with your hands if you are wearing gloves

11. Make sure the blade is:

    a. At the correct tension
    b. Properly set
    c. The correct width
    d. All of the above

12. When should you ask your instructor to check your setup?

    a. After you have made one test cut
    b. Before you turn the machine on
    c. When the machine is coasting
    d. When the machine is at full speed

WRITTEN TESTS

13. When must the guards be in place?

    a. At all times
    b. When the machine is at full speed
    c. When you are cutting
    d. When your hands are directly over the blades

14. Never use a blade that is:

    a. Broken
    b. Cracked
    c. Dull
    d. All of the above

INSTRUCTOR'S SECTION

TEST 2
Continued

END OF TEST

WRITTEN TESTS

1. How close should the table be to the sanding disc?

   a. 1/16 inch
   b. 1/8 inch
   c. 1/4 inch
   d. 1/2 inch

2. Correct dress for using the disc sander includes:

   a. Long hair kept tied back
   b. No ties, scarves, or jewelry
   c. Safety glasses or goggles
   d. All of the above

3. When should you make adjustments to the sander?

   a. After the machine is turned on
   b. Before the machine is plugged in
   c. When the disc is moving slowly
   d. When the disc is moving at full speed

4. Before you turn on the sander, you should make sure:

   a. Discs and belts are not torn or loose
   b. Guards and shields are in place
   c. Sand belt is running straight
   d. All of the above

INSTRUCTOR'S SECTION

TEST 3
DESIGN BRIEF 3: DISC SANDER

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 3 Continued

5. You should only sand work on the:

   a. Down side of the disc
   b. Inside of the disc
   c. Up side of the disc
   d. All of the above

6. When is it safe to leave the disc sander?

   a. As soon as you have turned off the machine
   b. When the machine has come to a complete stop
   c. When you are finished sanding
   d. When you have your instructor's permission

7. Which of the following safety rules should you follow when using the disc sander?

   a. Keep hands and fingers away from the abrasive surface of the disc
   b. Keep hands and fingers away from the glue side of the disc
   c. Make sure the sanding disc is securely fastened to the platen
   d. Both A and C

END OF TEST

WRITTEN TESTS

1. When you are drilling, the wood or metal stock should be held:

   a. By your helper
   b. In a clamp
   c. With your right hand
   d. With your left hand

2. Which of the following are not safe when you are operating a drill press?

   a. Jewelry
   b. Long, loose hair
   c. Neckties
   d. All of the above

3. Which of the following protective gear should you wear when operating the drill press?

   a. Canvas gloves
   b. Neoprene gloves
   c. Safety goggles
   d. Steeltoe boots

4. Which of the following items must you remove before drilling?

   a. Chuck
   b. Chuck key
   c. Guards
   d. Vise

INSTRUCTOR'S SECTION

TEST 4
DESIGN BRIEF 4:
DRILL PRESS

WRITTEN TESTS

5. When would you generally use a slower drill speed?

    a. Drilling into metal
    b. Drilling into wood
    c. Drilling into thick material
    d. Using a small drill bit

6. When do you have to force the drill into the work?

    a. Drilling into metal
    b. Never
    c. When using a slow drill speed
    d. When using a large drill bit

7. To avoid drilling into the table, you could:

    a. Adjust the drill chuck
    b. Adjust the depth stop
    c. Hold the stock 1 inch above the table
    d. Use a shorter drill bit

8. Always use a drill bit that is:

    a. Attached to the chuck key
    b. ¼" smaller than the desired hole diameter
    c. ½" larger than the desired hole diameter
    d. Sharp

INSTRUCTOR'S SECTION

TEST 4 Continued

WRITTEN TESTS

9. Do not move or adjust the table:

   a. Before you clamp the stock
   b. Before you turn on the drill
   c. While the drill is in motion
   d. While the key is in the chuck

10. Before you turn on the power, make sure:

    a. The chuck key has been removed
    b. The head is secure
    c. The table is secure
    d. All of the above

INSTRUCTOR'S SECTION

TEST 4
Continued

END OF TEST

WRITTEN TESTS

1. Stock cut on the jig/scroll saw must be:

   a. Flat on the bottom
   b. Flat on top
   c. Rounded on the bottom
   d. Rounded on top

2. Proper dress for using the jig/scroll saw includes:

   a. Long hair kept tied back
   b. No ties, scarves, or jewelry
   c. Safety glasses or goggles
   d. All of the above

3. Make adjustments to the machine when:

   a. The blade is moving slowly and the power is off
   b. The blade is moving slowly and the power is on
   c. The blade is stopped and the power is off
   d. The blade is stopped and the power is on

4. The hold-down should be adjusted so it is:

   a. As close to the work as possible
   b. As far from the work as possible
   c. Out of the way of the operator
   d. Behind the hold-down guard

INSTRUCTOR'S SECTION

TEST 5
DESIGN BRIEF 5: JIG/SCROLL SAW

WRITTEN TESTS

5. Make sure the blades are installed to cut on:
   - a. The center line
   - b. The down stroke
   - c. The right edge
   - d. The up stroke

6. Who should be in the operator's zone when you are using the jig/scroll saw?
   - a. Instructor only
   - b. Operator only
   - c. Operator and helper
   - d. Operator and instructor

7. Which of the following should you do before starting the jig/scroll saw?
   - a. Make sure blade is the proper size
   - b. Make sure the tension is correct
   - c. Turn all moving parts by hand to make sure they are clear
   - d. All of the above

8. Which of the following safety rules should you follow when feeding stock into the jig/scroll saw?
   - a. Feed the material at a moderate speed
   - b. Hold the stock firmly
   - c. Keep fingers and hands out of the path of the saw
   - d. All of the above

INSTRUCTOR'S SECTION

TEST 5
Continued

WRITTEN TESTS

9. When is it safe to leave the operator's zone?

   a. As soon as you have turned off the machine
   b. When the blade has come to a complete stop
   c. When you are finished with your cut
   d. When you have your instructor's permission

INSTRUCTOR'S SECTION

TEST 5
Continued

END OF TEST

WRITTEN TESTS

1. Stock cut on a jointer should not be shorter than:
   a. 3 inches
   b. 6 inches
   c. 12 inches
   d. 15 inches

2. When should you use a push stick?
   a. When jointing narrow or flat pieces of stock.
   b. When you need to force a piece of stock through the jointer.
   c. When the guards are raised during operation.
   d. When the machine is cutting but has not yet reached maximum speed.

3. Stock used on the jointer should be:
   a. At least 1 inch wide
   b. Free from materials like nails or screws
   c. Held securely against the fence
   d. All of the above

4. The knives must be sharp when jointing:
   a. All woods
   b. Hardwoods
   c. Softwoods
   d. Woods with nails or screws

INSTRUCTOR'S SECTION

TEST 6
DESIGN BRIEF 6: JOINTER

WRITTEN TESTS

5. When should you adjust the depth scale?
    - a. Before the machine reaches full speed
    - b. Before you turn the power on
    - c. Never
    - d. When the machine is at maximum speed

6. When should you begin the cut?
    - a. Before the machine reaches full speed
    - b. Before you turn the power on
    - c. When the machine reaches maximum speed
    - d. While you are adjusting the depth scale

7. What is the deepest cut you can make in pine?
    - a. 1/16 inch
    - b. 1/8 inch
    - c. 1/4 inch
    - d. 1/2 inch

8. When should you work against the grain?
    - a. Always
    - b. Never
    - c. When cutting softwoods
    - d. When cutting hardwoods

INSTRUCTOR'S SECTION

TEST 6
Continued

WRITTEN TESTS

9. Which of the following is a safety rule you must follow when using the jointer?

    a. Keep your mind on your work
    b. Make sure no one is standing behind the jointer while it is in operation
    c. Wear goggles, keep long hair tied back, and remove ties, scarves, and jewelry
    d. All of the above

10. When should you keep the guards down over the knives?

    a. Before you turn the machine on
    b. When cutting hardwoods
    c. Whenever the jointer is in operation
    d. When the jointer is at maximum speed

11. What should you do to make sure the fence will not slip when the jointer is used?

    a. Hold the fence down with the push stick
    b. Hold the fence down with your left hand
    c. Make sure the fence is in place and the clamping screws are tight
    d. Operate the machine at the lowest possible speed

INSTRUCTOR'S SECTION

TEST 6
Continued

WRITTEN TESTS

12. When can you make adjustments to the jointer?
    - a. Never
    - b. When it has not yet reached maximum speed
    - c. When it is operating at full speed
    - d. When it is turned off and unplugged

13. When passing stock over the jointer, change your hand position so your hands are never directly over the:
    - a. Guard
    - b. Knives
    - c. Push stick
    - d. Stock

INSTRUCTOR'S SECTION

TEST 6
Continued

END OF TEST

WRITTEN TESTS

1. What should you use to hold small pieces of wood that you are drilling?
   - a. Clamp or vise
   - b. Pliers
   - c. Your left hand
   - d. Your partner should hold the wood

2. Proper dress for using the portable drill includes:
   - a. Remove gloves
   - b. Remove ties, scarves, or jewelry
   - c. Safety glasses or goggles
   - d. All of the above

3. When would you generally use a slower drill speed?
   - a. Drilling into metal
   - b. Drilling into softwoods
   - c. Using a smaller drill bit
   - d. Using a sharp drill bit

4. When should you force the drill into the work?
   - a. Drilling into ceramic
   - b. Drilling into metal
   - c. Drilling into wood
   - d. Never

INSTRUCTOR'S SECTION

TEST 7
DESIGN BRIEF 7:
PORTABLE DRILL

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 7 Continued

5. Always use a drill bit that is:
   - a. At least ½ inch wide
   - b. Carbide-tipped
   - c. Sharp
   - d. Spiral

6. What should you do if the drill stalls while you are drilling a hole?
   - a. Click the power switch off and on until the drill restarts
   - b. Push the drill harder into the stock
   - c. Turn the power off and pull the drill out
   - d. Turn the adjustable speed knob to a higher speed until the drill restarts

7. Before you start the drill, you should:
   - a. Dress correctly for the job
   - b. Make any needed adjustments to the drill
   - c. Remove the chuck key
   - d. All of the above

8. When should you lock the drill into the ON position?
   - a. Always
   - b. Never
   - c. When drilling into metal
   - d. When drilling into thick stock

WRITTEN TESTS

9. How should you hold the portable drill?

   a. With both hands
   b. With your dominant hand
   c. With your right hand
   d. With your left hand

INSTRUCTOR'S SECTION

TEST 7
Continued

END OF TEST

WRITTEN TESTS

1. When you start your cut, the saw should be:

   a. Completely stopped
   b. Rotating at maximum speed
   c. Rotating but not yet at maximum speed
   d. None of the above

2. Remove wood scraps from the path of the blade with:

   a. A brush or piece of wood when the blade is at low speed
   b. A brush or piece of wood when the blade is completely stopped
   c. Compressed air
   d. Your fingers when the blade is completely stopped

3. After making each cut, the blade must be:

   a. Left near the operator
   b. Removed
   c. Returned to its position behind the guide fence
   d. Rotated below the guide fence

4. Before you use the saw, check to make sure the blade is:

   a. Sharp
   b. At the proper depth
   c. The proper blade for the job
   d. All of the above

INSTRUCTOR'S SECTION

TEST 8
DESIGN BRIEF 8
RADIAL ARM SAW

WRITTEN TESTS

5. Before you turn on the machine, you must make sure:

   a. All guards are in place
   b. The anti-kickback guard has been moved out of the way
   c. The wood you want to cut is firmly pressed against the guard
   d. All of the above

6. Keep your hands at least _______ away from the path of the saw blade.

   a. 1 inch
   b. 6 inches
   c. 9 inches
   d. 1 foot

7. Which hand should you use to operate the saw?

   a. Left hand
   b. Left hand if you are left-handed, right hand if you are right-handed
   c. Left hand if standing on the right side of the saw, right hand if on the left side
   d. Right hand

8. You may jam the machine if you feed or pull the wood into the saw:

   a. Too fast
   b. Too slowly
   c. Unevenly
   d. Using an up and down motion

INSTRUCTOR'S SECTION

TEST 8 Continued

WRITTEN TESTS

9. When you are crosscutting heavy stock or hardwood, you should feed the saw:
    - a. From the right side
    - b. Quickly
    - c. Slowly
    - d. Using an up and down motion

10. If you are cutting stock that is less than 4 inches wide, how many pieces can you cut at one time?
    - a. 1
    - b. 2
    - c. 3
    - d. 4

11. Do not remove the cut stock until you have:
    - a. Asked your instructor for permission
    - b. Brushed away wood scraps and shavings
    - c. Removed the anti-kickback guard
    - d. Returned the saw blade to its starting position

12. Dressing correctly to use the radial arm saw includes:
    - a. Remove ties, scarves and jewelry
    - b. Tie back long hair
    - c. Wear safety goggles
    - d. All of the above

INSTRUCTOR'S SECTION

TEST 8 Continued

WRITTEN TESTS

13. Do not make any adjustments to the machine unless it is:

    a. At a dead stop
    b. At the correct operating speed
    c. Moving slowly
    d. Unplugged

14. When should you ask your instructor to check your setup?

    a. After you have made one test cut
    b. After each cut
    c. Before you turn on the machine
    d. When the machine has reached the correct operating speed

15. When you are ripping stock, you should:

    a. Cut only one piece of wood at a time
    b. Feed the stock against the direction of the blade rotation
    c. Use the anti-kickback guard
    d. All of the above

16. Do not leave the saw until:

    a. It has slowed to a safe speed
    b. It is at a complete stop
    c. You have your instructor's permission
    d. You have unplugged the machine

INSTRUCTOR'S SECTION

TEST 8
Continued

END OF TEST

WRITTEN TESTS

1. Before plugging in the power cord, set the router's power switch:

    a. On its side
    b. To OFF
    c. To ON
    d. So it points away from you

2. Before changing cutter bits or making any adjustments, make sure:

    a. At least one hand is free
    b. Other students are at a safe distance
    c. The power cord is unplugged
    d. You can turn the router blades by hand

3. Before turning the router's power switch to ON, you should:

    a. Ask an instructor for permission
    b. Hold the router with your right hand
    c. Reverse the motor's rotation
    d. Try to make as deep a cut as possible

4. When you finish a cut, you should:

    a. Rest the router on its side
    b. Turn off the router
    c. Unplug the router
    d. All of the above

INSTRUCTOR'S SECTION

TEST 9
DESIGN BRIEF 9: ROUTER

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 9
Continued

5. Hold the stock to the work surface with:

   a. Both hands
   b. Clamps or vises
   c. Stock guide
   d. Your left hand

6. To dress correctly before using the router, you must:

   a. Remove ties, scarves, and jewelry
   b. Tie back long hair
   c. Wear safety goggles
   d. All of the above

7. What is the correct way to hold the router?

   a. Grip the housing with both hands
   b. Hold the guide knobs with both hands
   c. Hold the guide knob with your right hand
   d. Push the router with the push stick

8. Before using the router, make sure all bits and cutters are:

   a. Disconnected
   b. Dull
   c. Loose enough to rotate freely
   d. Properly tightened

9. What is the proper way to feed the router?

   a. Feed the router quickly into the stock
   b. Feed the router slowly into the stock
   c. Feed the stock quickly into the router
   d. Feed the stock slowly into the router

10. Keep your hands clear of:

    a. Guide knobs
    b. Router housing
    c. Rotating cutters
    d. Stock

TEST 9 Continued

END OF TEST

WRITTEN TESTS

1. When should the guards be in place?
   - a. At all times
   - b. When the saw is coasting
   - c. When the saw is at full speed
   - d. When your hands are directly over the blade

2. When ripping narrow pieces of stock, you should:
   - a. Have a helper support the weight
   - b. Raise the blade ½ inch above the wood's surface
   - c. Remove the guards
   - d. Use a push stick

3. Correct dress for using the table saw includes:
   - a. Long hair kept tied back
   - b. No ties, scarves, or jewelry
   - c. Safety glasses or goggles at all times
   - d. All of the above

4. Where should you stand when using the table saw?
   - a. Directly behind the blade
   - b. Directly in front of the blade
   - c. Off to one side of the blade
   - d. Any position

INSTRUCTOR'S SECTION

TEST 10
DESIGN BRIEF 10: TABLE SAW

WRITTEN TESTS

INSTRUCTOR'S SECTION

TEST 10
Continued

5. Make sure the saw blade is:

   a. Sharp
   b. Not cracked
   c. The right kind of blade
   d. All of the above

6. Do not cut ______ on a table saw:

   a. Against the grain
   b. Hardwoods
   c. Round stock
   d. Softwoods

7. When using a dado, you should:

   a. Have your instructor inspect the setup
   b. Hold the stock firmly
   c. Use a sharp blade
   d. All of the above

8. When is it safe to make adjustments to the table saw?

   a. After you have made one test cut
   b. When the power is off and the blade is stopped
   c. When the saw is moving at a safe speed
   d. When the saw is moving at full speed

9. When ripping stock, you should:

   a. Check for cracks in the stock
   b. Make sure the stock has no loose knots
   c. Use the rip fence
   d. All of the above

10. When are you allowed to have a helper while using the table saw?

    a. Any time
    b. Never
    c. When ripping long stock
    d. When ripping narrow stock

11. How far should you raise the blade above the wood's surface?

    a. 1/16 inch
    b. 1/8 inch
    c. 1/4 inch
    d. 1/2 inch

TEST 10
Continued

END OF TEST

TEST ANSWERS

1. c
2. c
3. a
4. c
5. b
6. d
7. c
8. b
9. d
10. b
11. a
12. a
13. b
14. c
15. d
16. b
17. a
18. a
19. b
20. a
21. d
22. a
23. b
24. d
25. c
26. b
27. a
28. c
29. b
30. d

INSTRUCTOR'S SECTION

TEST 1
DESIGN BRIEF 1: LABORATORY SAFETY

TEST ANSWERS

INSTRUCTOR'S SECTION

TEST 2
DESIGN BRIEF 2: BAND SAW

1. c
2. c
3. d
4. d
5. b
6. a
7. c
8. b
9. c
10. a
11. d
12. a
13. a
14. d

TEST 3
DESIGN BRIEF 3: DISC SANDER

1. a
2. d
3. b
4. d
5. a
6. b
7. d

TEST 4
DESIGN BRIEF 4: DRILL PRESS

1. b
2. d
3. c
4. b
5. a
6. b
7. b
8. d
9. c
10. d

TEST ANSWERS

INSTRUCTOR'S SECTION

TEST 5
DESIGN BRIEF 5:
JIG/SCROLL SAW

1. a
2. d
3. c
4. a
5. b
6. b
7. d
8. d
9. b

TEST 6
DESIGN BRIEF 6:
JOINTER

1. c
2. a
3. d
4. a
5. b
6. c
7. b
8. b
9. d
10. c
11. c
12. d
13. b

TEST 7
DESIGN BRIEF 7:
PORTABLE DRILL

1. a
2. d
3. a
4. d
5. c
6. c
7. d
8. b
9. a

TEST ANSWERS

INSTRUCTOR'S SECTION

TEST 8
DESIGN BRIEF 8: RADIAL ARM SAW

1. b
2. b
3. c
4. d
5. a
6. b
7. a
8. a
9. c
10. a
11. d
12. d
13. a
14. c
15. d
16. b

TEST 9
DESIGN BRIEF 9: ROUTER

1. b
2. c
3. a
4. d
5. b
6. d
7. b
8. d
9. b
10. c

TEST ANSWERS

1. a
2. d
3. d
4. c
5. d
6. c
7. d
8. b
9. d
10. c
11. b

All Supplemental Activities and Challenges should be evaluated to the satisfaction of the instructor.

INSTRUCTOR'S SECTION

TEST 10
DESIGN BRIEF 10: TABLE SAW

SUPPLEMENTAL ACTIVITIES AND CHALLENGES

BIBLIOGRAPHY

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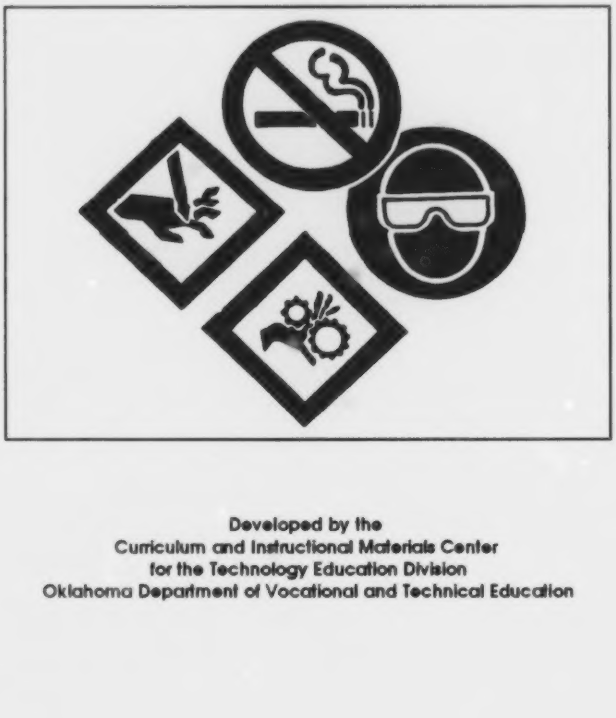
TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 1:
LABORATORY SAFETY



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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Create a Technology Lab Safety Map

❻ Complete Posttest

LAB SAFETY

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- Gain factual information
- Make generalizations
- React to written material

Cognitive Activities Skills:
- Collect/record information
- Create a finished product

Job Acquisition/Development Skills:
- Practice good work habits/attitudes

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-30 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-30.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
    a. Pretest
    b. Posttest
2. Technology Lab safety map
3. Answers to Objective 2 Challenge.

GOAL

The Laboratory Safety Design Brief will help you learn how to work in the Technology Lab to avoid injuring yourself or others or damaging equipment.

OBJECTIVES

In this Design Brief, you will complete the following activities:

1. Create a Technology Lab safety map.
2. Correctly answer questions about chemical safety based on product labels.
3. Complete the Posttest on Technology Lab safety with a score of 100%.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

INTRODUCTION

Your safety in the Technology Lab area is more important than anything else. There is more to safety, though, than learning how to safely operate the various machines and tools you will be using. Safety also means learning how to *act safely* at all times while in the Technology Lab.

TECHNOLOGY LAB SAFETY RULES

The safety instructions you will learn in the Laboratory Safety Design Brief are for your protection. They apply to all areas of the Technology Lab and should be followed at all times.

Remember: your safety and the safety of others is at stake!

1. ***WALK*** — never run — in Technology Lab.
2. Never clown around, play practical jokes, or try to distract other students working in the Technology Lab.
3. Be considerate of others and follow all safety rules while in the Technology Lab.
4. Stay in your assigned area of the Technology Lab.
5. Always practice correct safety procedures under normal working conditions. This will help you work safely when under pressure.

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

6. Dress correctly when working in the Technology Lab, no matter what equipment or tools you may be using. Remove neck ties, scarves, and jewelry. Keep long hair pulled back and fastened away from your face.

7. Report any safety violations or unsafe working conditions to an instructor.

8. Never use any equipment until you have been trained on how to use it.

9. Get your instructor's permission before you use any equipment, even when you know how to use it.

10. Read and follow the safety instructions for any tool or equipment that you use.

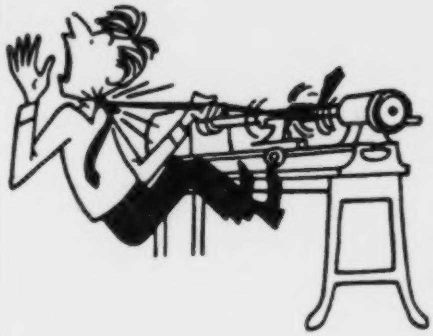
11. If you are not using a tool or piece of equipment, ***leave it alone.***

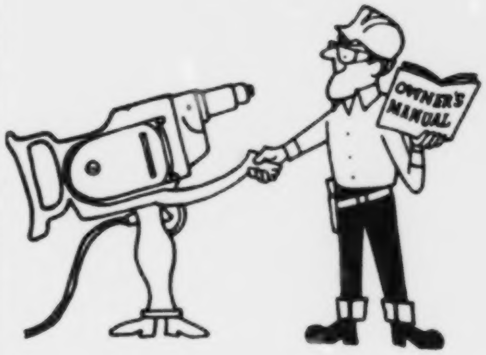
12. Do not lean on machines. You could accidentally press a switch or throw a control that could endanger the operator when starting the machine.

13. Only one student at a time can operate a piece of equipment. Do not start or stop a machine for another student, except in an emergency.

14. Never throw any tools or materials.

LAB SAFETY





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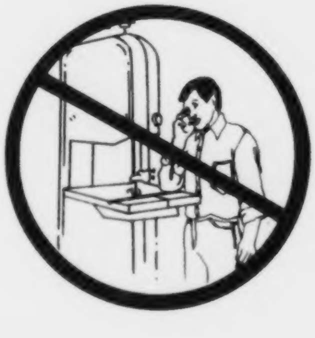
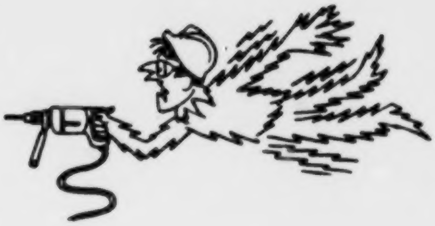
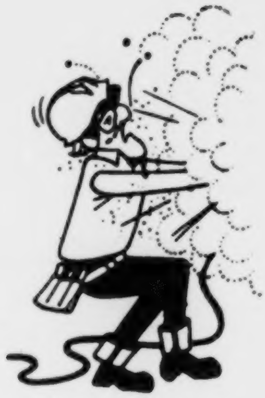


15. Never shine a laser light into someone's eyes.

16. Never stand on a wet floor while using electrical equipment.



17. Wear the appropriate personal protective equipment when using any tools or equipment, but **do not rely on the protective gear to keep you safe.**



18. Use a tool or piece of equipment only for its specific purpose, and use the correct tool for the job.

19. Plan your work carefully and think through each step before you complete it.

20. Store hazardous materials in approved safety containers.

21. Do not use power tools or equipment unless your instructor is present.

22. Close your work area at the end of each class period by clearing away scrap materials and replacing tools and materials in their proper storage areas. A neat and orderly Technology Lab helps you avoid accidents by reducing unsafe working conditions.

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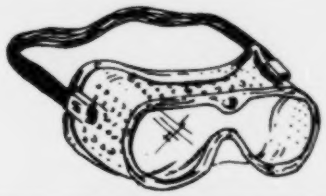
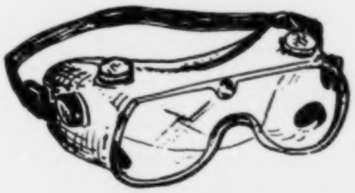
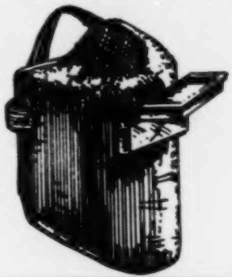
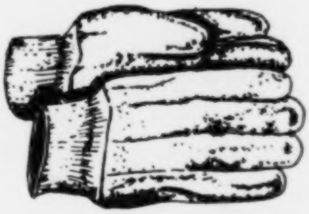
PERSONAL PROTECTIVE EQUIPMENT

Items such as goggles, gloves, and welding helmets are called ***personal protective equipment.*** Each of these items is designed to provide protection from a particular kind of hazard. The Occupational Safety and Health Administration (OSHA) makes protective equipment a requirement for activities that involve dangerous equipment or materials.

Never rely solely on personal protective equipment to keep you safe. You must still follow all safety rules. Protective gear is like a seatbelt in a car. It can reduce or even prevent an injury, but it cannot protect you from everything–you still have to drive safely. Protective gear is your "last line of defense" against unusual and unexpected events, not against the normal hazards of equipment and materials.

It is important to use the right protective equipment for the job. For example, there are different kinds of goggles to guard against different kinds of eye hazards. The chart on the next page shows some common kinds of personal protective gear and examples of where they would be used.

Type of equipment	Examples of uses	Example of equipment
Dust goggles	Woodworking (guard against flying chips, dust, kickback, etc.)	
Chemical goggles	Plastics (guard against splashing and spilling) Spray painting	
Welding helmet	Welding	
Gloves	Photography (protection from chemicals) Plastics (protection from hot materials) Woodworking (protection from splinters)	

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

FIRE EXTINGUISHER SAFETY

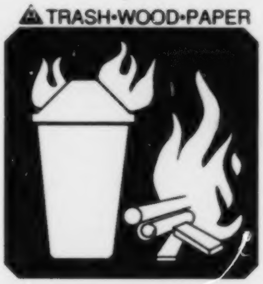
Fire can strike anywhere, but you must be especially careful in the Technology Lab. For your safety and the safety of others, you must not only try to prevent fires, but know what to do if a fire breaks out.

You know that you can use a fire extinguisher to stop a small fire, but did you know that using the wrong kind of fire extinguisher can actually make a fire worse? Fire extinguishers are designed to put out a specific *class* (type) of fire. There are four classes of fires:

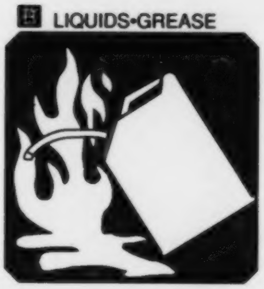
- Class A: ordinary combustibles (paper, wood, cloth, trash, etc.)
- Class B: flammable liquids (grease, oil, gasoline, etc.)
- Class C: electrical equipment
- Class D: flammable metals (special extinguishers for these fires are found in industry and research areas you will not have one in your Technology Lab.)

Different substances are used to put out different types of fires. For example, a Class A fire extinguisher might use plain water under pressure. Using this type of extinguisher on a grease fire would just splatter the burning grease and spread the fire. The chemicals in a Class B or Class C extinguisher could spread a trash fire. Some fire extinguishers are multi-purpose, and can fight more than one kind of fire.

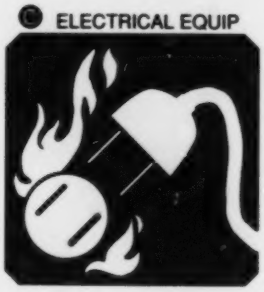
A TRASH•WOOD•PAPER



B LIQUIDS•GREASE



C ELECTRICAL EQUIP



Always check the label on any fire extinguisher before you use it. The label will have both letters and pictures telling you what classes of fires your extinguisher can be used on. If it is not the right kind for the fire, call for emergency help instead of wasting time and possibly making the fire worse by using the wrong extinguisher.

You should also read the label for operating instructions before you use a fire extinguisher. Most extinguishers have a metal pin that you must remove, and a wire or plastic inspection band that you must break before you can use the extinguisher. Some older extinguishers must be turned upside down, but most fire extinguishers should be carried right side up.

Follow these steps when using a fire extinguisher:

1. **Check the label** to see if it is the right kind of extinguisher and read the operating instructions.

2. **Pull the pin** that keeps the handle from being pushed down.

3. **Break the wire or plastic band** around the handle.

4. **Point the nozzle** toward the fire (release the hose if it is clipped to the side of the extinguisher)

5. **Sweep the nozzle** back and forth at the base of the flames.

6. **Make sure** the fire is out. Check for any embers or hot spots.

7. **Tell your instructor** what happened.

Never use a fire extinguisher unless there is a fire. If you use an extinguisher while "playing around," it cannot be used again until it is recharged. If a fire starts before the extinguisher is recharged, your actions may cause damage or injuries.

Don't wait to get your instructor's permission before using a fire extinguisher on a fire. In an emergency, the most important thing is to put the fire out as soon as possible.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

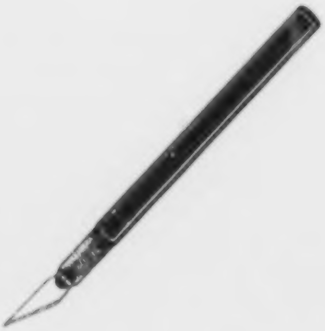
LAB SAFETY

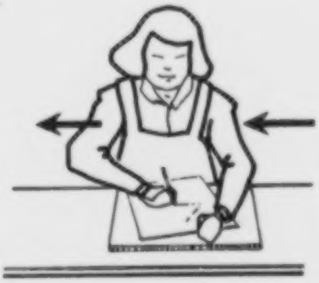
CRAFT KNIFE SAFETY

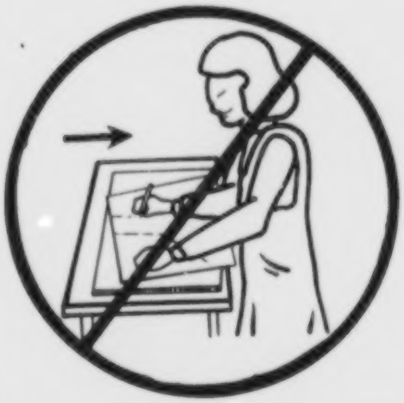
You will use a craft knife in many Technology Lab activities. There are different kinds of craft knives, but most have a removable blade that can be replaced when it becomes dull. Many also have a cap that fits over the blade when the knife is not in use.

Craft knives are very sharp and can be dangerous if used incorrectly. Always follow these safety rules when using a craft knife:

1. Do not use a knife with a dull blade.
2. Use a knife for **cutting only**; never use a knife to hammer, pry open, or unscrew.
3. Always use a cutting board or special cutting surface under the material you are cutting. Make sure the material being cut is lying flat on the cutting surface.
4. When cutting, always pull the knife away from your body. Never pull a knife toward your body.
5. **Never** throw a craft knife or blade.
6. Keep the blade covered with the protective cap when the knife is not in use.







TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

HOT GLUE GUN SAFETY

You will use a hot glue gun in some Technology Lab activities. A glue gun provides melted glue that dries quickly for a very strong, fast bond.

Because the hot glue can cause burns, you must follow these safety rules when using the glue gun:

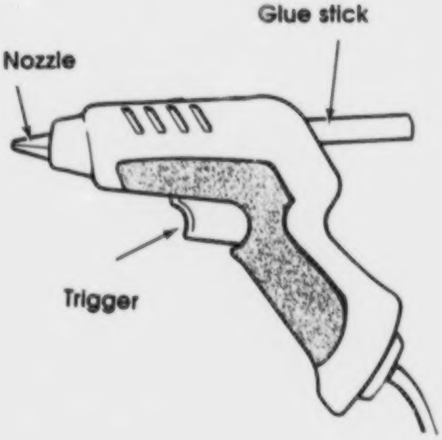
1. Never touch the melted glue or the nozzle of the glue gun you can be seriously burned.

2. Do not put anything except glue sticks into the glue gun.

3. Use the correct size glue sticks in the glue gun. Do not try to cut a glue stick that is too big.

3. Wait until the glue has melted completely before using it on your project. Test the glue by squirting a small amount on a piece of scrap material it should be runny and soft, but it will not be as runny as glue from a bottle.

4. Be careful when holding glued pieces together. Melted glue can soak through thin or porous material and cause burns.



TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

HAZARD ALERT MESSAGES

The Safety Design Briefs use the American National Standards Institute (ANSI) standardized system of safety signs, which can help keep you safe both in the lab and later on the job. These safety signs use signal words, graphics, and color to inform you about hazards.

ANSI uses five signal words to alert you. You will find these words both in the design briefs and on the machines you learn to operate. When you see these words, pay close attention–your safety is at stake.

DANGER means that you might be killed and will probably be maimed if you do not follow instructions.

WARNING means you might be maimed and probably will be seriously injured if you do not follow instructions.

CAUTION means you might be seriously injured and probably will be hurt if you do not follow instructions.

IMPORTANT means that if you do not follow instructions you will damage or destroy the machine or some other property.

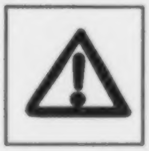
NOTICE means that if you do not follow instructions you will not be able to do the job effectively.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

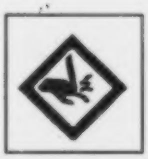
LAB SAFETY

HAZARD ALERT GRAPHICS

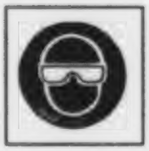
Three types of graphics are used with the signal words to help alert you to hazards.



The first graphic in the right column is called the *alert symbol.* It is used only with **DANGER, WARNING,** and **CAUTION.** When you see this symbol, pay attention and read the message carefully.



The second graphic in the right column is called a *hazard alert graphic.* There are two types. This type, an *injury graphic,* shows you what kind of injury (amputation in this example) could occur if you do not follow instructions.



The last graphic in the right column is the second type of hazard alert graphic. This *avoidance graphic* shows you what you need to do (wear safety glasses in this example) to avoid injury from the hazard.

COLOR IN THE TECHNOLOGY LAB

Color is used in the Technology Lab to mark possible hazards. Safety equipment is also color-coded to make it easier to find and recognize. Most equipment is marked using the following standardized colors:

Blue = caution against starting equipment

- Switches or levers that start equipment are often painted blue.
- Electric switch plates are often painted blue.

Yellow = hazard

- Yellow or yellow-and-black lines around equipment show the operator's areas (boundaries that should only be crossed by people using the equipment).
- Yellow lines are often painted around band and jig saw blades.
- Obstructions that cannot be moved are painted yellow to make them more visible.

Green = safety

- First-aid and safety equipment is either painted green or has a green sign or label.

Red = fire protection equipment or stop signals

- Fire hoses and extinguishers are either painted red or have a red sign or label.
- Emergency stop buttons for equipment are red.
- Safety cans for flammable liquids are red or have a red label.
- Danger signs (such as the hazard alert messages in the Safety Design Briefs) are red.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

OBJECTIVE 1

Create a Technology Lab Safety Map.

TOOLS AND MATERIALS

- Floor plan of your Technology Lab
- Markers and/or colored pencils

CHALLENGE

Make a safety map of your Technology Lab. On the floor plan provided by your instructor, mark locations of the following:

- Fire extinguishers
- Emergency exits
- Eye wash stations
- First aid kit

EVALUATION

Safety maps will be graded based on neatness and completeness.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

CHEMICAL SAFETY

You should always read and follow label directions on chemicals and supplies, and the Technology Lab is no exception. Some of the materials you will use in the Technology Lab may be hazardous if you use or handle them improperly.

Under OSHA regulations, employers in many industries must keep their employees informed about the hazardous materials they come in contact with. A *Material Safety Data Sheet (MSDS)* for each hazardous chemical must be made available to employees. The MSDS describes:

- The properties of the chemical (for example, what it looks like or smells like)
- The hazards associated with the chemical (for example, if it is flammable or poisonous)
- How to control the chemical (it may need to be protected from light, heat, moisture, etc.)

These regulations do not apply to schools. Your instructor may have a MSDS for the chemicals you are using, but it is not required.

Instead of (or in addition to) a MSDS, many materials you use will have safety instructions. Even everyday products such as glues and cleansers have safety instructions that you should read before using the product.

For example, many common household cleaning products contain chlorine bleach (such as scrubbing cleansers like Ajax® or Comet®), while others contain ammonia (such as liquid dishwashing detergent). Mixing bleach and ammonia causes dangerous fumes.

If you were trying to wash a pan with baked-on food, you might think it would be a good idea to mix a scrubbing cleanser with dishwashing detergent. However, if you had read the labels on both products, you would learn that chlorine bleach and ammonia should not be mixed. You would also see that one product contained chlorine bleach and the other contained ammonia. You can see how even products that seem safe and harmless can be dangerous if you do not use them properly—especially if you do not read their labels.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

OBJECTIVE 2

Correctly answer questions about chemical safety based on product labels.

TOOLS AND MATERIALS

- Examples of product packages on next two pages
- Pen or pencil
- 2 sheets notebook paper

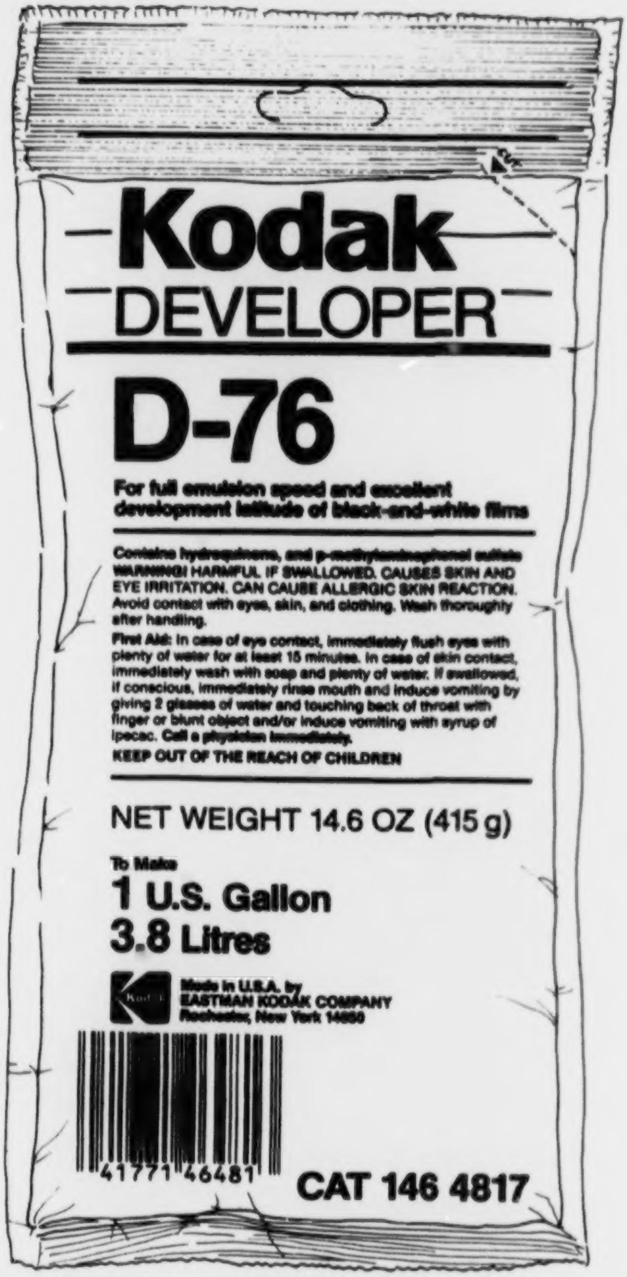
CHALLENGE

Read package labels and answer the following questions about the safe and effective use of products you may use in the Technology Lab.

1. Is there anything you should do to this product before you use it?
2. Is there anything this product should not be mixed with?
3. Is this product harmful if you get it on your skin?
4. What should you do if you accidentally swallow some of this product?

EVALUATION

Evaluation will be based on actual package label.



Kodak
DEVELOPER
D-76

For full emulsion speed and excellent development latitude of black-and-white films

Contains hydroquinone, and p-methylaminophenol sulfate
WARNING! HARMFUL IF SWALLOWED. CAUSES SKIN AND EYE IRRITATION. CAN CAUSE ALLERGIC SKIN REACTION. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

First Aid: In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In case of skin contact, immediately wash with soap and plenty of water. If swallowed, if conscious, immediately rinse mouth and induce vomiting by giving 2 glasses of water and touching back of throat with finger or blunt object and/or induce vomiting with syrup of ipecac. Call a physician immediately.

KEEP OUT OF THE REACH OF CHILDREN

NET WEIGHT 14.6 OZ (415 g)

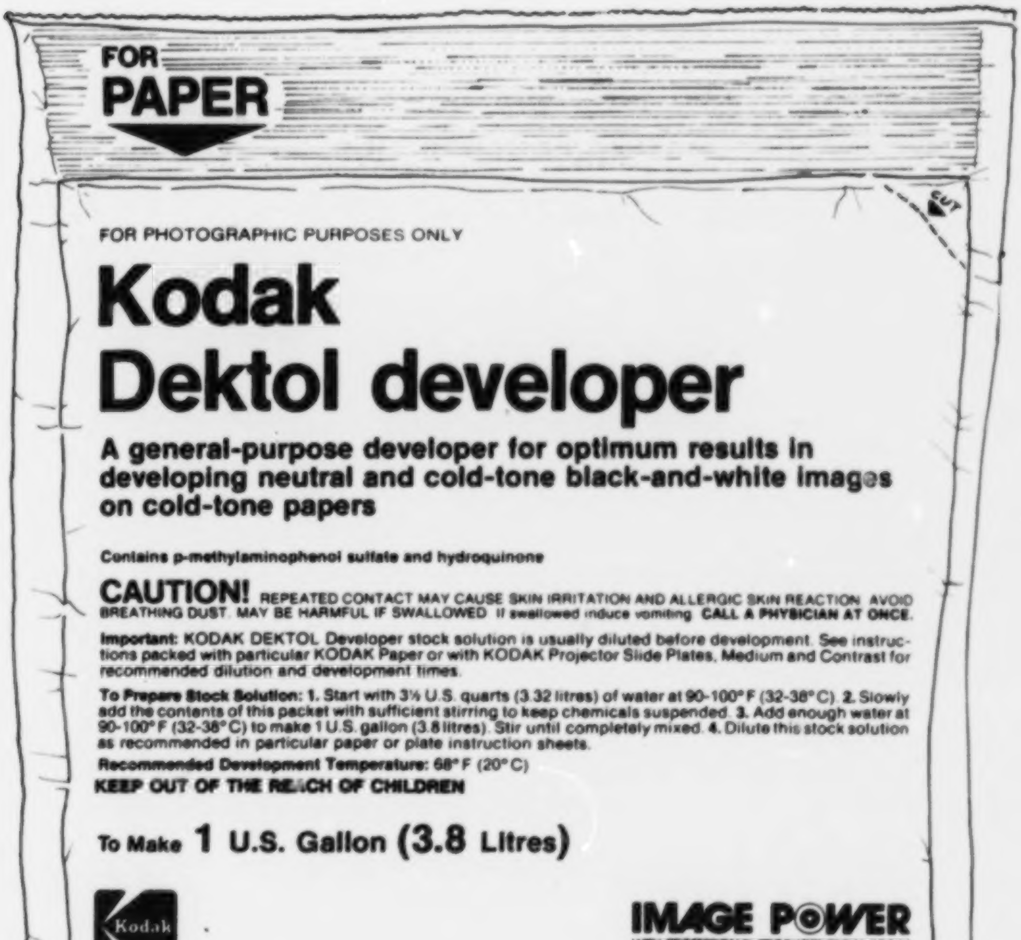
To Make
1 U.S. Gallon
3.8 Litres

Made in U.S.A. by
EASTMAN KODAK COMPANY
Rochester, New York 14650

41771 46481

CAT 146 4817

Reprinted courtesy of Eastman Kodak Company, Rochester, New York.



FOR
PAPER

CUT

FOR PHOTOGRAPHIC PURPOSES ONLY

Kodak Dektol developer

A general-purpose developer for optimum results in developing neutral and cold-tone black-and-white images on cold-tone papers

Contains p-methylaminophenol sulfate and hydroquinone

CAUTION! REPEATED CONTACT MAY CAUSE SKIN IRRITATION AND ALLERGIC SKIN REACTION. AVOID BREATHING DUST. MAY BE HARMFUL IF SWALLOWED. If swallowed induce vomiting. **CALL A PHYSICIAN AT ONCE.**

Important: KODAK DEKTOL Developer stock solution is usually diluted before development. See instructions packed with particular KODAK Paper or with KODAK Projector Slide Plates, Medium and Contrast for recommended dilution and development times.

To Prepare Stock Solution: 1. Start with 3½ U.S. quarts (3.32 litres) of water at 90-100° F (32-38° C). 2. Slowly add the contents of this packet with sufficient stirring to keep chemicals suspended. 3. Add enough water at 90-100° F (32-38° C) to make 1 U.S. gallon (3.8 litres). Stir until completely mixed. 4. Dilute this stock solution as recommended in particular paper or plate instruction sheets.

Recommended Development Temperature: 68° F (20° C)

KEEP OUT OF THE REACH OF CHILDREN

To Make 1 U.S. Gallon (3.8 Litres)

IMAGE POWER
WITH PROFESSIONAL PRODUCTS FROM KODAK

Read This Notice: This product will be replaced if defective in manufacture, labeling, or packaging. Except for such replacement, this product is sold without warranty or liability even though defect, damage, or loss is caused by negligence or other fault.

Made in U.S.A. by
EASTMAN KODAK COMPANY
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KP 68252E Printed in U.S.A.

NET WEIGHT 18 OZ (1 LB 2 OZ) (510 GRAMS)

CAT 146 4726

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

LAB SAFETY

OBJECTIVE 3

Complete the test over Technology Lab safety with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for the Technology Lab safety procedures.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 31-60 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of paper to record your answers and number your answers 31-60.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and retake the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 2: BAND SAW

Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Complete Posttest

❼ Demonstrate safe use of the band saw.

BAND SAW

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- Gain factual information
- Make generalizations
- React to written material

Job Acquisition/Development Skills
- Master specific job task/procedure
- Develop good work habits/attitudes
- Develop self-confidence/esteem

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-14 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-14.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
   a. Pretest
   b. Posttest

GOAL

The Band Saw Design Brief will help you learn how to use a band saw safely.

OBJECTIVES

In this Design Brief, you will complete the following activities:

1. Complete the Posttest on Band Saw Safety with a score of 100%.
2. Demonstrate safe use of the band saw.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

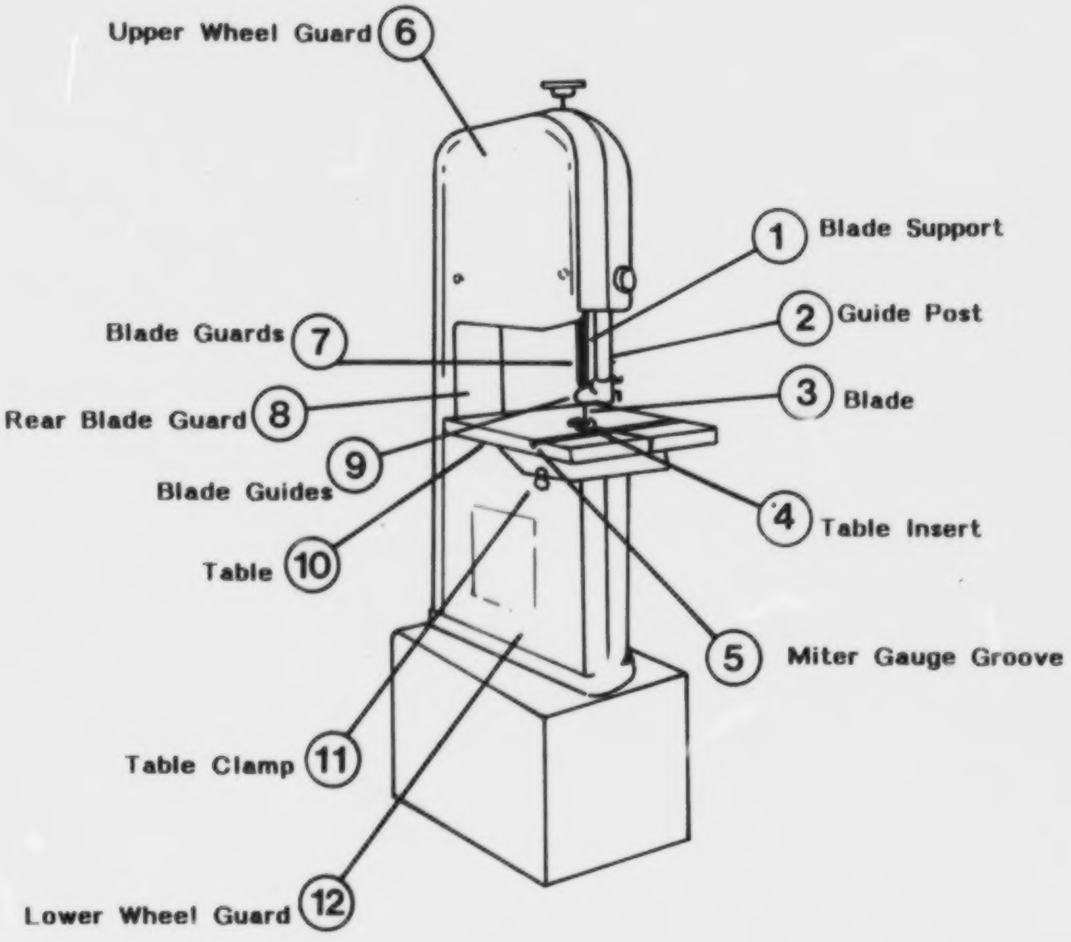
BAND SAW

INTRODUCTION

Band saws are used to cut thick blocks of wood into curved shapes.

WORDS YOU SHOULD KNOW

Feed	to push lumber into the saw mechanism to be cut
Stock	lumber already cut to standard sizes (such as a *2 by 4*)


Upper Wheel Guard 6
1 Blade Support
2 Guide Post
Blade Guards 7
3 Blade
Rear Blade Guard 8
9
Blade Guides
4 Table Insert
Table 10
5 Miter Gauge Groove
Table Clamp 11
Lower Wheel Guard 12

Band Saw

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

SAFETY RULES

The following is a list of safety procedures for using the band saw. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job—remove ties, scarves, jewelry, or gloves, and keep long hair tied back.
2. Wear safety goggles at all times while operating the band saw.
3. Keep the guards in place at all times.
4. Adjust the upper guard to ¼ inch above the stock.
5. To prevent serious injury to your hand or fingers, never adjust the upper and lower guides while the band saw is moving.
6. Make sure the blade is sharp, the proper width, properly set, at the correct tension, and not cracked or broken.
7. Your instructor must check your setup before you turn the machine on.
8. Stand on the left side of the saw to avoid injury if the blade breaks.
9. If the stock binds or pinches the blade, turn off the power. "Back out" after the machine comes to a stop.

10. A clicking sound indicates a cracked blade. If you hear this sound, turn off the saw and allow the blade to come to a complete stop before removing stock. Notify your instructor.

11. If the blade breaks, shut off power and stand away from the machine until the machine stops.

12. Remove scrap material from the saw blade with a stick or brush.

13. Allow the blade to coast to a stop when you finish work. Do not make cuts while machine is coasting.

14. Do not leave the machine until the power is off and the blade stops moving.

15. **Never use the band saw unless your instructor is with you.**

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

OBJECTIVE 1

Complete the Safety Test for the band saw with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the band saw. You **cannot** move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 15-28 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 15-28.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Band Saw Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

OBJECTIVE 2

Demonstrate safe operation of the band saw.

TOOLS AND MATERIALS

- Band saw
- Safety glasses or goggles
- Dust mask (optional)

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Tell your instructor you are ready to see a demonstration of how to properly operate the band saw using the procedure described in this Design Brief.

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the band saw, tell your instructor you are ready to demonstrate the proper operation of the band saw.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

FOLLOW THESE STEPS:

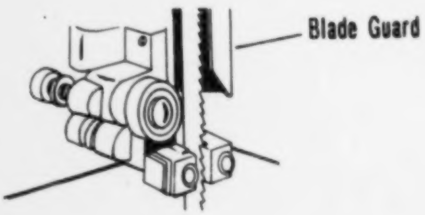
WARNING
MOVING PARTS can catch hair, jewelry, and loose clothing. DRESS PROPERLY.

STEP 2: Make sure you are dressed correctly, remove ties, scarves, and jewelry, and tie back long hair.

WARNING
FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.

STEP 3: Wear safety glasses or goggles while operating band saw.

WARNING
MOVING BLADE can cut off hand or fingers. KEEP SAW GUARDS IN PLACE.



TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

FOLLOW THESE STEPS:

STEP 4: Place stock beside blade.

STEP 5: Using a rule, set the blade guard ¼ inch above the stock.

STEP 6: Set the upper and lower blade guides to their correct positions.

STEP 7: Make sure the blade is the correct width for your project.

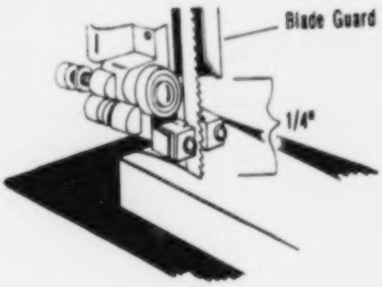
STEP 8: Stand on the left side of the saw. If you stand on the right side and the blade breaks, you could be hit by flying metal.

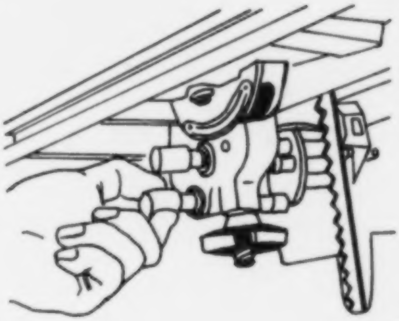
STEP 9: Ask your instructor for permission to turn on the saw.

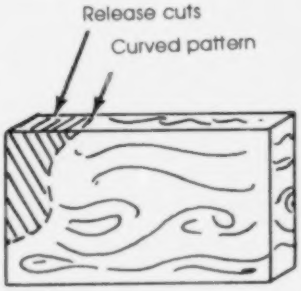
STEP 10: Cut stock under full power. Do not cut when blade is coasting to a stop.

STEP 11: Carefully make release cuts before cutting long curves.

STEP 12: If the stock binds or pinches the blade, shut off the power. Allow the blade to come to a complete stop. Then back the stock out along the path of the cut.







TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

BAND SAW

FOLLOW THESE STEPS:

STEP 13: If the blade breaks, SHUT OFF THE POWER AND STAND BACK. When the saw comes to a complete stop, notify your instructor.

STEP 14: After demonstrating safe operation of the band saw, turn the machine off.

STEP 15: Clean up entire work area and return tools and materials to their proper storage areas.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 3:
DISC SANDER

Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Complete Posttest

❼ Demonstrate safe use of the disc sander

DISC SANDER

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- ♦ Gain factual information
- ♦ Make generalizations
- ♦ React to written material

Job Acquisition/ Development Skills
- ♦ Master specific job task/procedure
- ♦ Develop good work habits/attitudes
- ♦ Develop self-confidence/esteem

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-7 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-7.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
    a. Pretest
    b. Posttest

GOAL

The Disc Sander Design Brief will help you learn how to use a disc sander safely.

OBJECTIVES

In this Design Brief, you will complete the following activities:

1. Complete the Posttest on Disc Sander Safety with a score of 100%.
2. Demonstrate safe use of the disc sander.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER

INTRODUCTION

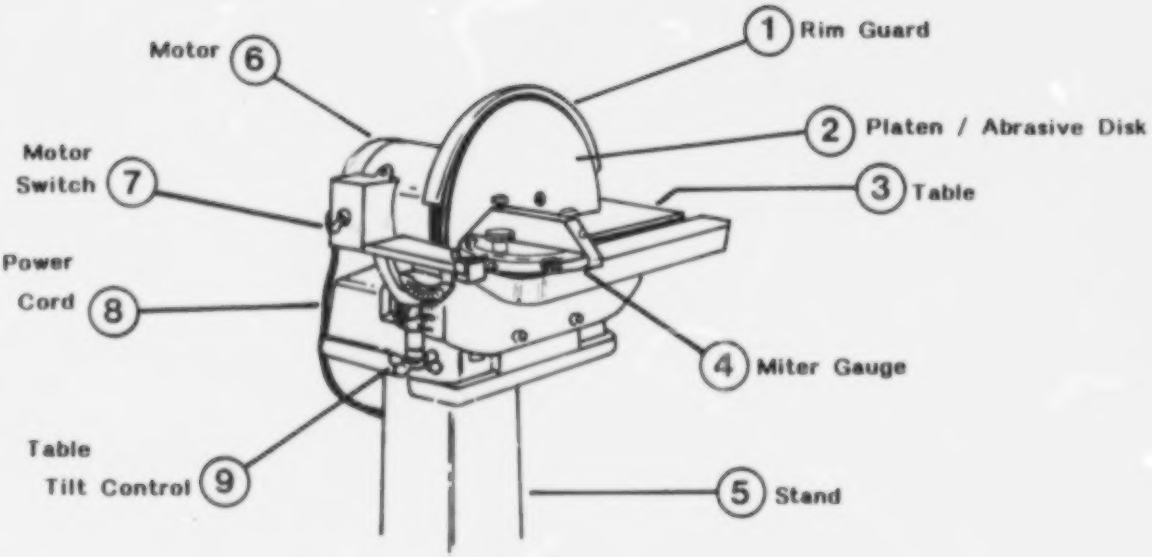
The disc sander is used on the end-grain of lumber to remove material and smooth the surface.

WORDS YOU SHOULD KNOW

Stock	lumber already cut to standard sizes (such as a *2 by 4*)

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER


① Rim Guard
② Platen / Abrasive Disk
③ Table
④ Miter Gauge
⑤ Stand
Motor ⑥
Motor Switch ⑦
Power Cord ⑧
Table Tilt Control ⑨

DISC SANDER

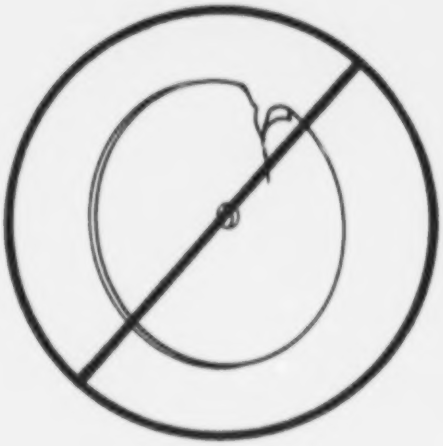
TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

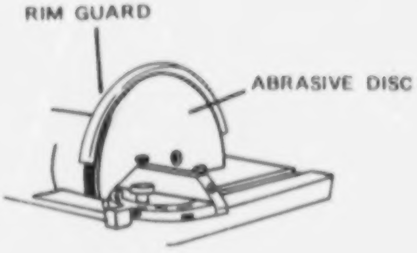
DISC SANDER

The following is a list of safety procedures for using the disc sander. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job–remove ties, scarves, and jewelry, keep long hair tied back, and wear safety goggles.
2. Make any adjustments before the sander is plugged in.
3. Before turning the machine on, check that discs are not torn or loose.
4. Make sure guards and shields are in place.
5. Make sure the glue holding the disc to the sander is secure.
6. Only sand work on the down side of the disc.
7. Keep hands and fingers away from the abrasive surface of the disc.
8. Keep the table within 1/16 inch of the sanding disc.
9. Do not leave the machine until the power is off and the machine has stopped.
10. Never use the disc sander unless your instructor is with you.

SAFETY RULES





TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER

OBJECTIVE 11

Complete the Safety Test for the disc sander with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the disc sander. You **cannot** move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 8-14 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 8-14.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Disc Sander Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER

OBJECTIVE 12

Demonstrate safe operation of the disc sander.

TOOLS AND MATERIALS

- Disc sander
- Sanding disc
- Wood stock
- Safety glasses or goggles
- Dust mask (optional)

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Tell your instructor you are ready to see a demonstration of how to properly operate the disc sander using the procedure described in this Design Brief.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER

FOLLOW THESE STEPS:

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the disc sander, tell your instructor you are ready to demonstrate the proper operation of the disc sander.

WARNING

MOVING PARTS can catch hair, jewelry, and loose clothing. DRESS PROPERLY.

STEP 2: Wear proper clothing, remove jewelry, and fasten long hair.

WARNING

FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DISC SANDER

FOLLOW THESE STEPS:

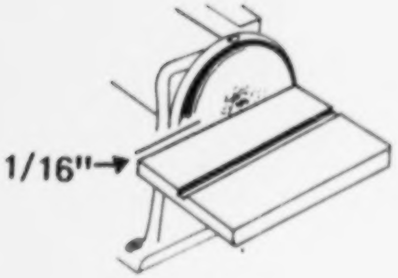
STEP 3: Wear safety glasses or goggles while operating machine. Wear a dust mask if working in a dusty area.

STEP 4: Make sure guards and shields are in place.

STEP 5: Check that the sanding disc is securely fastened to the platen.

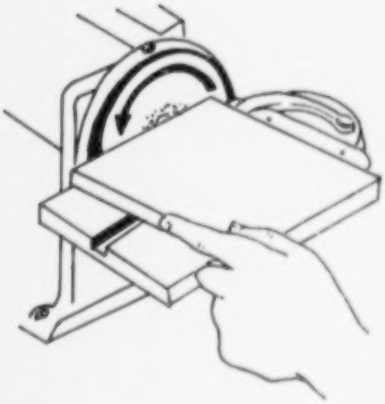
STEP 6: Make sure the sanding disc is not torn. If it is torn, have your instructor help you replace it.

STEP 7: Tilt the table to within 1/16-inch of the sanding disc.



STEP 8: Turn the power ON.

STEP 9: Using the miter gauge, hold the stock flat against the table with the area to be sanded on the side of the disc that rotates DOWN. Move the material back and forth.



STEP 10: After you finish sanding, turn the power OFF. Wait until the sander coasts to a complete stop or stop the sander with a piece of scrap wood.

STEP 11: Clean up entire work area and return tools and materials to their proper storage areas.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 4: DRILL PRESS

Developed by the
Curriculum and Instructional Materials Center
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Oklahoma Department of Vocational and Technical Education

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

1. Complete Pretest
2. Read *Assignments to Turn In*
3. Read *Goal*
4. Read *Objectives*
5. Read *Words You Should Know*
6. Complete Posttest
7. Demonstrate the safe operation of the drill press

DRILL PRESS

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- Gain factual information
- Make generalizations
- React to written material

Job Acquisition/Development Skills:
- Practice good work habits/attitudes

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-10 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-10.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DRILL PRESS

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
    a. Pretest
    b. Posttest

GOAL

The Drill Press Safety Design Brief will help you learn how to use a drill press safely.

OBJECTIVES

In this design brief, you will complete the following activities:

1. Complete the Posttest on Drill Press safety with a score of 100%.
2. Demonstrate safe use of the drill press.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

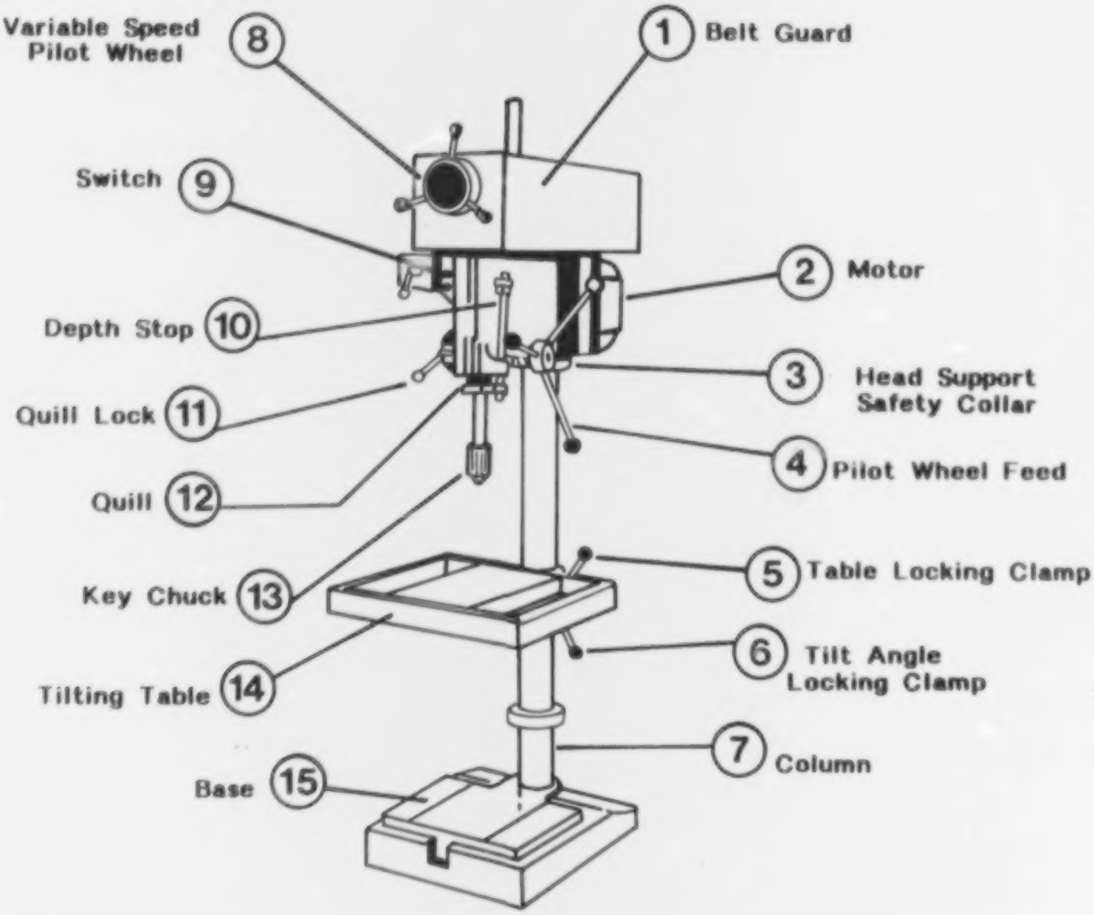
DRILL PRESS

INTRODUCTION

The drill press is used with a drill bit to bore holes of a selected size into wood and metal.

WORDS YOU SHOULD KNOW

Bit	the part of a drill that bores holes
Chuck	the part of a drill that rotates the steel
Chuck key	removable piece that locks the drill bit into the chuck
Steel	the threaded part of the drill where the bit is attached
Stock	material already cut to standard sizes (such as a *2 by 4*)


Variable Speed Pilot Wheel ⑧
① Belt Guard
Switch ⑨
② Motor
Depth Stop ⑩
③ Head Support Safety Collar
Quill Lock ⑪
Quill ⑫
④ Pilot Wheel Feed
⑤ Table Locking Clamp
Key Chuck ⑬
⑥ Tilt Angle Locking Clamp
Tilting Table ⑭
⑦ Column
Base ⑮

Drill Press

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DRILL PRESS

SAFETY RULES

The following is a list of safety procedures for using the drill press. Study these procedures carefully. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job–remove ties, scarves or jewelry, tie back long hair, and remove gloves. **Always wear safety goggles when drilling.**
2. Make sure guards are in place before drilling.
3. Remove the chuck key before starting the drill.
4. Adjust the table or depth stop to avoid drilling into the table.
5. Use a clamp or vise to hold stock pieces while drilling–**not** your hands.
6. Always use a sharp drill bit.
7. Make sure table and head are secure before turning power on.
8. Do not move or adjust the table while the drill is in motion.
9. Use a slower speed when drilling into metal or using a larger drill bit.
10. Do not force the drill into the work.
11. **Never** use the drill press unless your instructor is **with you.**

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DRILL PRESS

OBJECTIVE 1

Complete the Safety Test for the drill press with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the drill press. You **cannot** move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 11-20 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 11-20.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Drill Press Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DRILL PRESS

OBJECTIVE 2

Demonstrate the safe operation of the drill press.

TOOLS AND MATERIALS

- Drill press
- Safety glasses or goggles
- Wood or metal stock
- Vise or clamps
- Drill bits (various sizes)
- Mallet or hammer
- Punch
- Brush

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Tell your instructor you are ready to see a demonstration of how to properly operate the drill press using the procedure described in this Design Brief.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DRILL PRESS

FOLLOW THESE STEPS:

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the drill press, tell your instructor you are ready to demonstrate the proper operation of the drill press.

CAUTION

MOVING PARTS can catch loose clothing, jewelry, and hair. DRESS PROPERLY.

STEP 2: Remove jewelry. Fasten loose hair. Dress properly for operating the drill press.

WARNING

FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.

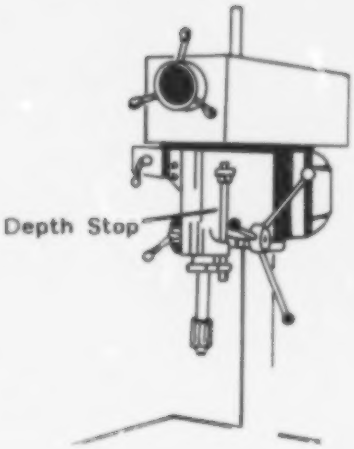
STEP 3: Put on safety glasses or goggles before operating drill press.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DRILL PRESS

FOLLOW THESE STEPS:

STEP 4:	Make sure all guards are in place before operating drill press.
STEP 5:	Use clamps to fasten the wood or metal stock to the table.
STEP 6:	Adjust the depth stop to prevent the drill bit from drilling into the table.



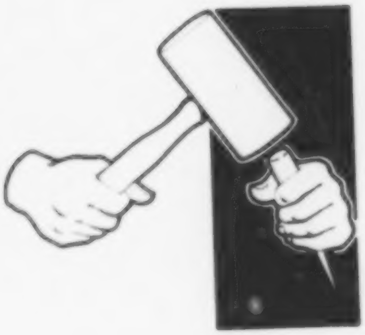
IMPORTANT

Choose the correct speed and bit size for drilling metal or wood.

CAUTION

FLYING PARTS. Chuck key can fly out of chuck and strike people. REMOVE KEY FROM CHUCK.

STEP 8:	Remove the chuck key from the chuck before turning on the drill press.
STEP 9:	Choose the correct size drill bit for your project.
STEP 10:	Use the mallet and center punch to punch metal stock where the hole is to be drilled.



TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

DRILL PRESS

FOLLOW THESE STEPS:

CAUTION

FLYING PIECES. Stock that gets caught on drill be can be thrown with great force. If stock gets caught on drill bit and begins to spin, DO NOT LET GO OF THE PILOT FEED WHEEL (HAND WHEEL). Hold the handle while you turn off the drill press. Do not release the handle until the drill has come to a complete stop.

STEP 11: Drill the hole.

STEP 12: When you are finished drilling, turn off the drill press.

STEP 13: Do not remove wood or metal stock from drill press until the bit has come to a complete stop. Use a brush to remove shavings from table.

STEP 14: When you are finished with the demonstration, clean up work area and return tools to their proper places.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 5:
JIG/SCROLL SAW

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Complete Posttest

❼ Demonstrate safe use of the jig/scroll saw

JIG/SCROLL SAW

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- Gain factual information
- Make generalizations
- React to written material

Job Acquisition/Development Skills
- Master specific job task/procedure
- Develop good work habits/attitudes
- Develop self-confidence/esteem

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JIG/SCROLL SAW

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-9 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-9.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JIG/SCROLL SAW

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
   a. Pretest
   b. Posttest

GOAL

The Design Brief will help you learn how to use a jig/scroll saw safely.

OBJECTIVES

In this Design Brief, you will complete the following activities:

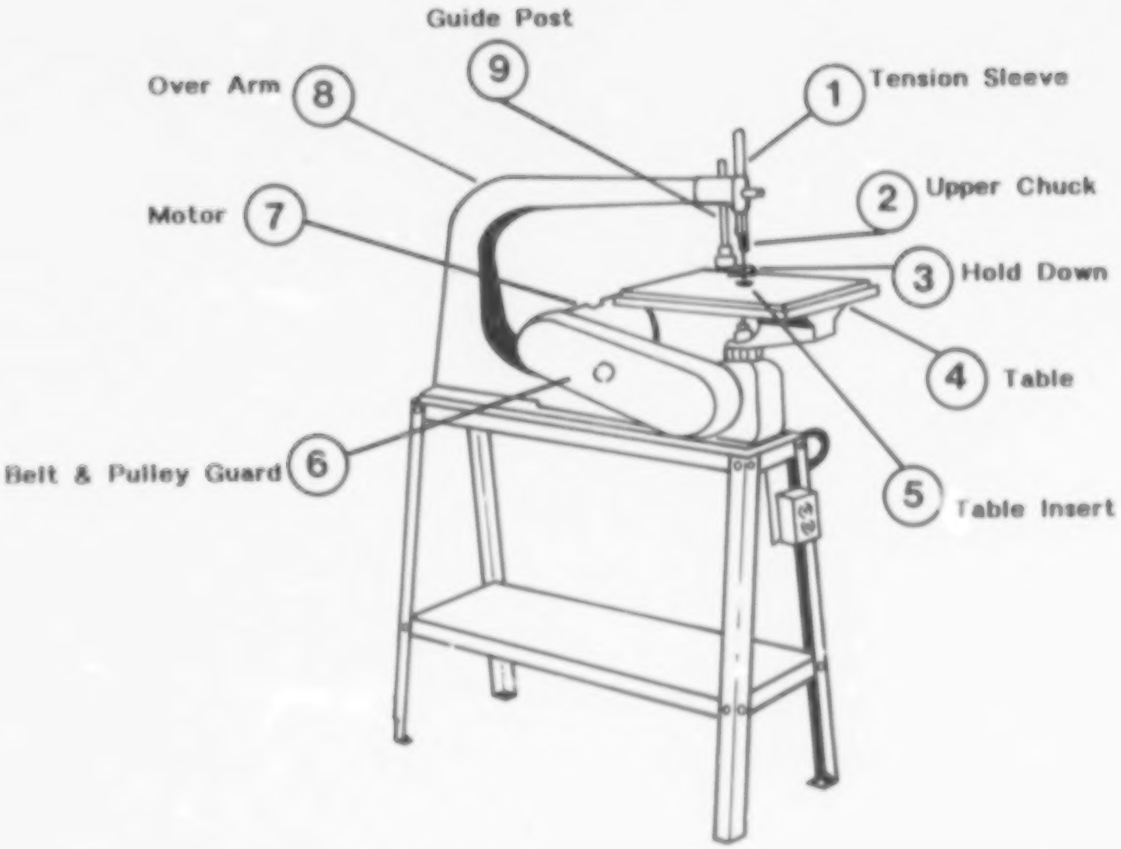
1. Complete the Posttest on Jig/Scroll Saw Safety with a score of 100%.
2. Demonstrate safe use of the jig/scroll saw.

INTRODUCTION

The jig/scroll saw is used for making curved cuts, shaping lumber for special purposes.

WORDS YOU SHOULD KNOW

Feed	to push lumber into the saw mechanism to be cut
Stock	lumber already cut to standard sizes (such as a *2 by 4*)


Guide Post
9
Over Arm
8
1
Tension Sleeve
2
Upper Chuck
Motor
7
3
Hold Down
4
Table
Belt & Pulley Guard
6
5
Table Insert

Jig/Scroll Saw

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JIG/SCROLL SAW

SAFETY RULES

The following is a list of safety procedures for using the jig/scroll saw. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job remove ties, scarves, and jewelry, and keep long hair tied back.
2. Wear safety goggles at all times while operating the jig/scroll saw.
3. Do not cut stock unless it is flat on the bottom.
4. Make adjustments to the machine when the power is off and the blade is stopped.
5. Make sure blades are installed to cut on the down stroke.
6. Make sure blade is the proper size and tension is correct.
7. Adjust hold-down so it is as close as possible to the work.
8. Make sure you are the only person inside the operator's zone.
9. Before starting the jig/scroll saw, turn all moving parts by hand to make sure all parts are clear.
10. Hold the stock firmly.

11. Feed the material into the machine at a moderate rate of speed.

12. Keep fingers and hands out of the path of the saw.

13. When you finish with the saw, do not leave the operator's zone until the saw blade has stopped moving.

14. Never use the jig/scroll saw unless your instructor is with you.

OBJECTIVE 1

Complete the Safety Test for the jig/scroll saw with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the jig/scroll saw. You **cannot** move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 10-18 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 10-18.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Jig/Scroll Saw Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JIG/SCROLL SAW

OBJECTIVE 2

Demonstrate safe operation of the jig/scroll saw.

TOOLS AND MATERIALS

- Jig/Scroll Saw
- Wood Stock
- Safety Glasses or Goggles

PROCEDURE

FOLLOW THESE STEPS:

JIG/SCROLL SAW

STEP 1: Tell your instructor you are ready to see a demonstration of how to properly operate the jig/scroll saw using the procedure described in this Design Brief.

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the jig/scroll saw, tell your instructor you are ready to demonstrate the proper operation of the jig/scroll saw.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JIG/SCROLL SAW

FOLLOW THESE STEPS:

WARNING
MOVING PARTS can catch hair, jewelry, and loose clothing. DRESS PROPERLY.

STEP 2: **Make sure you are dressed properly. Remove all jewelry, scarves, and ties, and tie back long hair.**

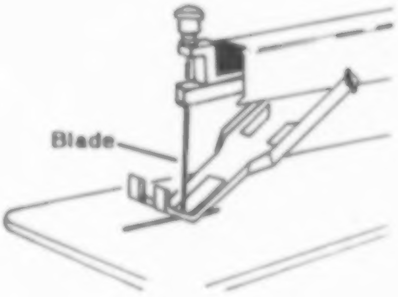
WARNING
FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.

STEP 3: **Put on safety glasses or goggles. Wear a face shield if working in a dusty area.**

STEP 4: **Make sure the saw is turned OFF, then install blades to cut on the downstroke.**

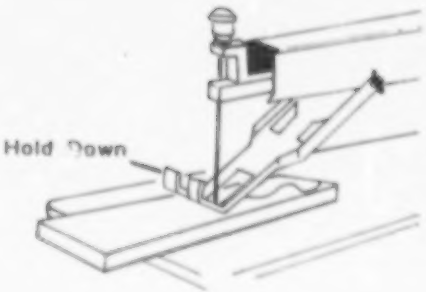
STEP 5: **Install the correct size blade. Tighten the lower blade tension first, then tighten the upper blade tension.**

STEP 7: **Adjust blade tension according to your instructor's directions.**



TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JIG/SCROLL SAW



FOLLOW THESE STEPS:

STEP 8: Place the stock to be cut next to the blade and under the hold-down foot. Adjust the hold-down foot as close as possible to the stock without causing binding.

STEP 9: Check that all parts are clear by turning the saw by hand.

STEP 10: Set the saw's motor to the correct speed.

STEP 11: Make sure bystanders are at least 6 feet away from saw before turning it on.

STEP 12: Ask your instructor for permission to turn on the saw.

WARNING

SAW BLADE can cut off hands or fingers. KEEP HANDS AWAY FROM BLADE.

STEP 13: Hold the stock firmly and feed it into the saw at a moderate speed. **Keep your hands and fingers away from the blade.**

FOLLOW THESE STEPS:

STEP 14:	After demonstrating safe operation of the jig/scroll saw, turn the power to OFF.
STEP 15:	After the blade comes to a **complete stop**, clear away scraps on saw table. Use a brush, not your hand, to clean table.
STEP 16:	Clean up entire work area. Return tools and materials to their proper storage areas.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 6: JOINTER

Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Complete Posttest

❼ Demonstrate safe use of the jointer

JOINTER

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- Gain factual information
- Make generalizations
- React to written material

Job Acquisition/Development Skills
- Master specific job task/procedure
- Develop good work habits/attitudes
- Develop self-confidence/esteem

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-13 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-13.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
   a. Pretest
   b. Posttest

GOAL

The Jointer Design Brief will help you learn how to use a jointer safely.

OBJECTIVES

In this Design Brief, you will complete the following activities:

1. Complete the Posttest on jointer safety with a score of 100%.

2. Demonstrate safe use of the jointer

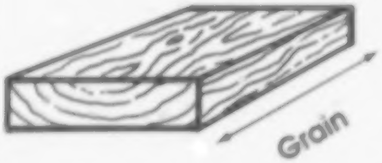
TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

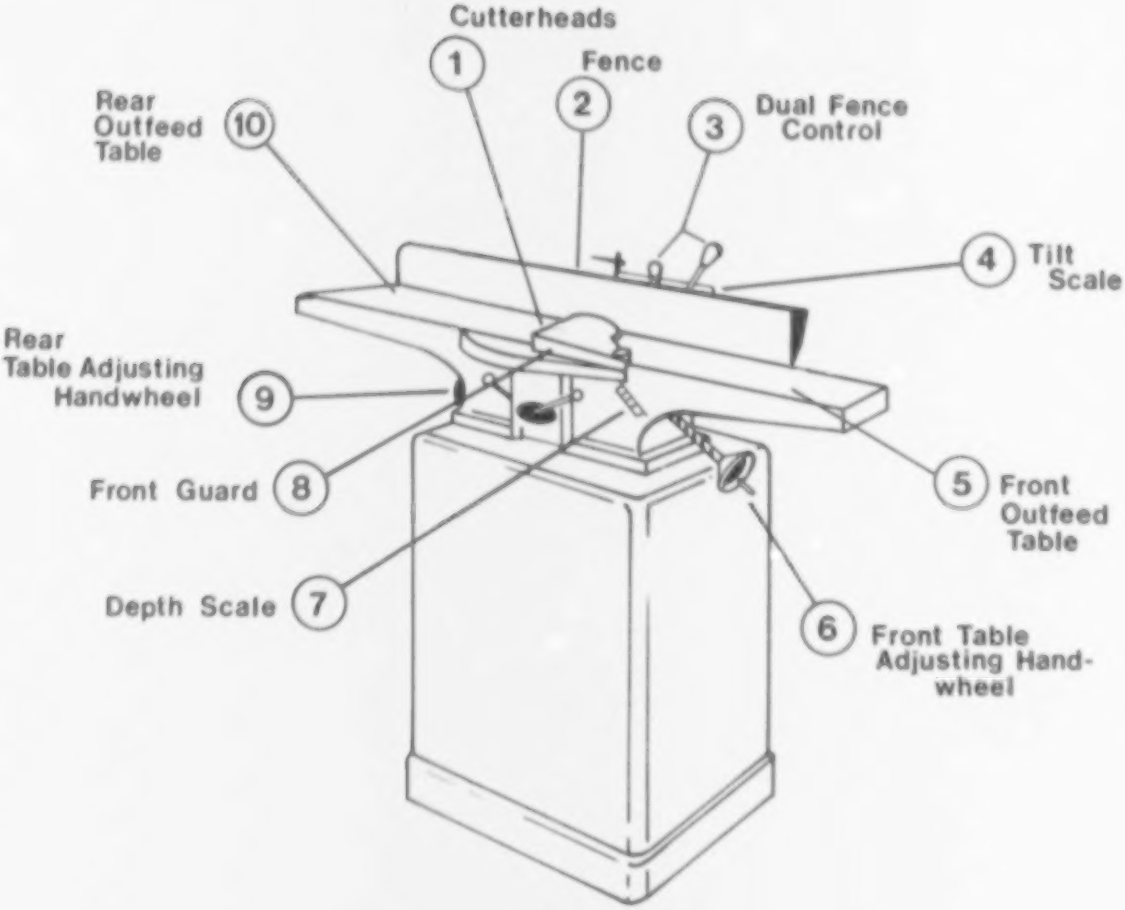
INTRODUCTION

The jointer is used to plane the ends and sides of boards so they can fit together smoothly.

WORDS YOU SHOULD KNOW



Grain	the general direction of fibers in a piece of wood
Hardwood	wood from trees with leaves (instead of needles), such as oak or maple
Push stick	piece of wood used to push stock through the machine, keeping the operator's hands away from the blades
Softwood	wood from trees with needles (instead of leaves), such as pine
Stock	lumber already cut to standard sizes (such as a *2 by 4*)


Cutterheads
1
Fence
2
Dual Fence Control
3
Rear Outfeed Table
10
4
Tilt Scale
Rear Table Adjusting Handwheel
9
Front Guard
8
5
Front Outfeed Table
Depth Scale
7
6
Front Table Adjusting Handwheel

JOINTER

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

SAFETY RULES

The following is a list of safety procedures for using the jointer. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job remove ties, scarves, jewelry, or gloves, and keep long hair tied back. **Always wear safety goggles when operating the jointer.**
2. Do not use stock less than 12" long and 1" wide.
3. Remove materials that might gap or dull blades — such as nails — from stock.
4. Do not use stock that cannot be securely held against the fence.
5. Make sure fence is in place and clamping screws are tight so the fence will not slip when jointer is used.
6. Use a push stick when jointing stock shorter than 15 inches and for narrow pieces.
7. Make sure the knives are sharp and securely installed.
8. Keep guards down over knives at all times while jointer is in operation.
9. Adjust the depth scale before turning the power on.

10. Do not cut deeper than 1/8 inch on softwoods or 1/16 inch on hardwoods.

11. Wait until the jointer reaches maximum speed before you start the cut.

12. Do not work against the grain or force the cut.

13. When passing stock over the jointer, change your hand position so your hands will never be directly over the knives.

14. Keep your mind on your work. Do not look around or talk to others while operating the jointer.

15. Make sure no one is standing behind the jointer while it is in operation.

16. **Never** use the jointer unless your instructor is **with you.**

16. Do not oil or adjust the jointer while in operation. Make all adjustments with the machine turned off and unplugged from the wall socket.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

OBJECTIVE 1

Complete the Safety Test for the jointer with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the jointer. You cannot move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 14-26 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 14-26.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Jointer Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

OBJECTIVE 2

Demonstrate the safe operation of the Jointer.

TOOLS AND MATERIALS

- Jointer
- Wood stock
- Safety glasses or goggles
- Push stick

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Tell your instructor you are ready to see a demonstration of how to properly operate the jointer using the procedure described in this Design Brief.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

FOLLOW THESE STEPS:

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the jointer, tell your instructor you are ready to demonstrate the proper operation of the jointer.

WARNING

MOVING PARTS can catch hair, jewelry, and loose clothing. DRESS PROPERLY.

⚠

STEP 2: Wear proper clothing, remove jewelry, and fasten long hair.

WARNING

FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.

⚠

STEP 3: Put on safety glasses or goggles.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

FOLLOW THESE STEPS:

STEP 4: Check to see that the guards and fence are in place and working properly. Always keep the guard in place over the knives while operating the jointer.

STEP 5: Make sure the blades are sharp.

STEP 6: Adjust the depth scale to the size of the cut you want to make before turning on the jointer.

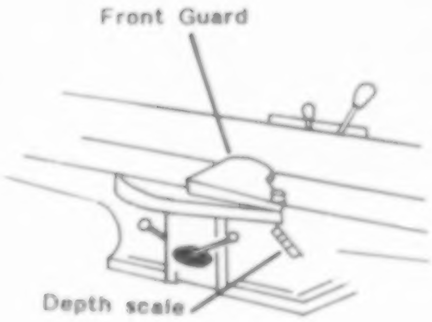
STEP 7: Ask your instructor to set knives at equal heights to prevent kickback.

STEP 8: Ask your instructor to check the set-up.

STEP 9: Stand to one side of jointer, then turn on the machine.

STEP 10: Pass the stock over the jointer, being sure to move your hand out of the way so it is never directly over the knives (this is called the *step over method*.) Use the push stick at all times.

STEP 11: Turn off the jointer.



TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

JOINTER

FOLLOW THESE STEPS:

STEP 12: After demonstrating safe operation of the jointer, clean up your work area. Put away all tools and supplies.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 7: PORTABLE DRILL

Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Complete Posttest

❼ Demonstrate the safe operation of the portable drill

PORTABLE DRILL

SUMMARY OF ACTIVITIES

Reading Comprehension Skills

- ♦ Gain factual information
- ♦ Make generalizations
- ♦ React to written material

Job Acquisition/Development Skills:

- ♦ Practice good work habits/attitudes

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-9 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-9.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

PORTABLE DRILL

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
    a. Pretest
    b. Posttest

GOAL

The Portable Drill Safety Design Brief will help you learn how to use a portable hand drill safely.

OBJECTIVES

In this design brief, you will complete the following activities:

1. Complete the Posttest on Portable Drill safety with a score of 100%.
2. Demonstrate safe use of the portable drill.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

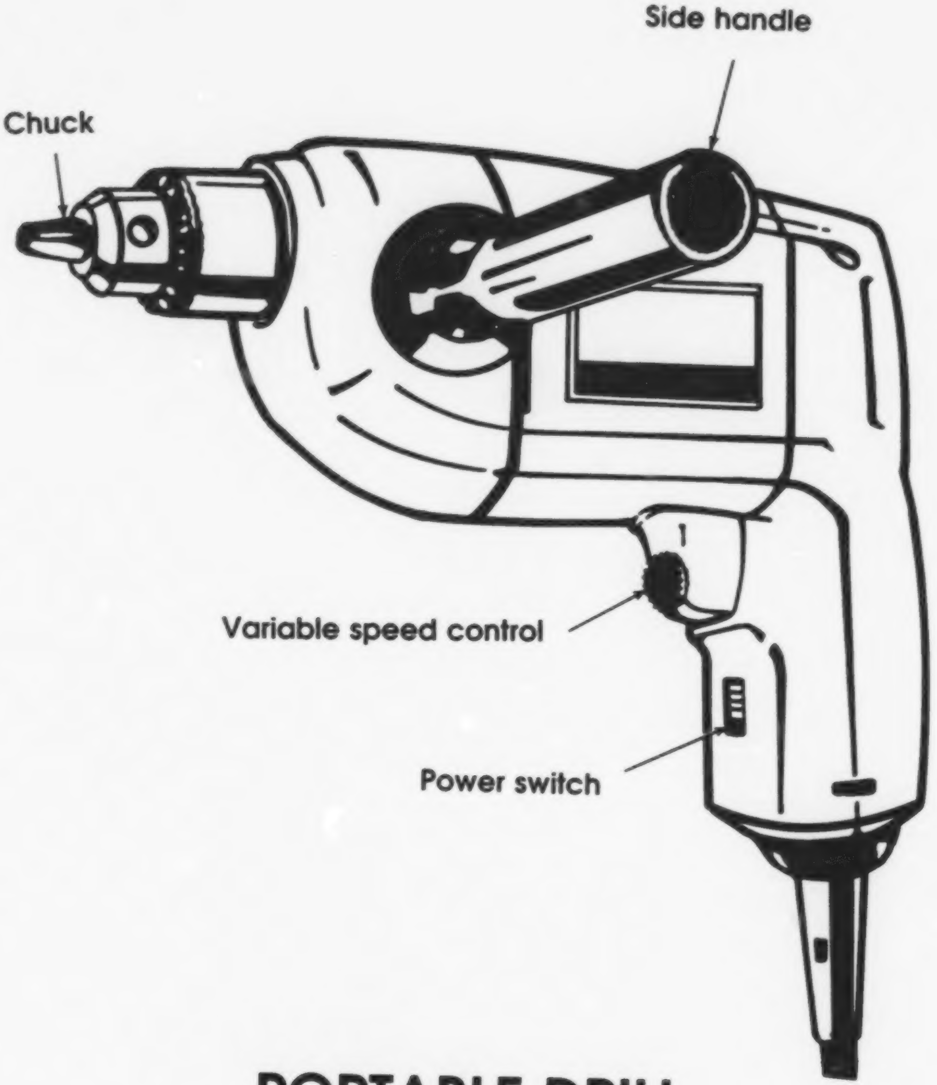
PORTABLE DRILL

INTRODUCTION

The portable drill is used with a drill bit to bore holes of a selected size into wood and metal.

WORDS YOU SHOULD KNOW

Bit	the part of a drill that bores holes
Chuck key	removable piece that locks the drill bit into place
Stock	material already cut to standard sizes (such as a *2 by 4*)


Side handle
Chuck
Variable speed control
Power switch

PORTABLE DRILL

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

PORTABLE DRILL

SAFETY RULES

The following is a list of safety procedures for using the portable drill. Study these procedures carefully. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job remove ties, scarves or jewelry, tie back long hair, and remove gloves. **Always wear safety goggles when drilling.**
2. Remove the chuck key before starting the drill.
3. Use a clamp or vise to hold stock pieces while drilling. Do not hold small pieces by hand while drilling.
4. Always use a sharp drill bit.
5. Make adjustments to the drill with the power turned to OFF and the power cord unplugged.
6. Do not lock the drill into the ON position.
7. Use the correct drill speed you will generally use a slower speed when drilling into metal or using a larger drill bit.
8. If the drill stalls, turn the power to OFF and pull the drill out. Do not try to restart the drill by turning the power on and off.

9. Never carry the drill by the cord or with your finger on the power switch.
10. Hold the drill firmly with both hands.
11. Do not force the drill into the work.
12. Never use the drill unless your instructor is with you.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

PORTABLE DRILL

OBJECTIVE 1

Complete the Safety Test for the portable drill with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the portable drill. You **cannot** move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 10-18 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 10-18.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Portable Drill Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

PORTABLE DRILL

OBJECTIVE 6

Demonstrate the safe operation of the portable drill.

TOOLS AND MATERIALS

- Portable drill
- Safety glasses or goggles
- Wood stock
- Vise or clamps
- Drill bits (various sizes)
- Mallet or hammer
- Punch
- Brush

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Tell your instructor you are ready to see a demonstration of how to properly operate the portable drill using the procedure described in this Design Brief.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

PORTABLE DRILL

FOLLOW THESE STEPS:

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the portable drill, tell your instructor you are ready to demonstrate the proper operation of the drill.

CAUTION

MOVING PARTS can catch loose clothing, jewelry, and hair. DRESS PROPERLY.

STEP 2:	Remove jewelry. Fasten loose hair. Dress properly for operating the portable drill.

WARNING

FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.

STEP 3:	Put on safety glasses or goggles before operating drill.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

PORTABLE DRILL

FOLLOW THESE STEPS:

STEP 4: Use clamps to fasten the stock to the work surface.

IMPORTANT

Choose the correct speed and bit size for drilling metal or wood.

STEP 5: Choose the correct size drill bit for your project.

CAUTION

FLYING PARTS. Adjusting key can fly out of chuck and strike people. REMOVE KEY FROM CHUCK.

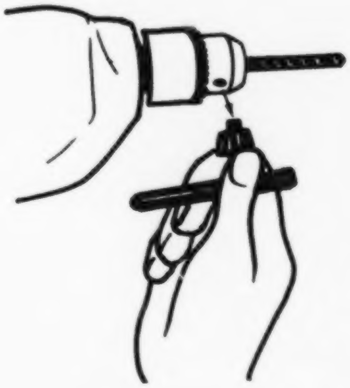
STEP 6: Remove the adjusting key from the chuck.

STEP 7: Use the mallet and center punch to punch the stock where the hole is to be drilled.

STEP 8: Turn on the drill and select the correct speed.

IMPORTANT

If stock gets caught on drill bit, turn off drill.

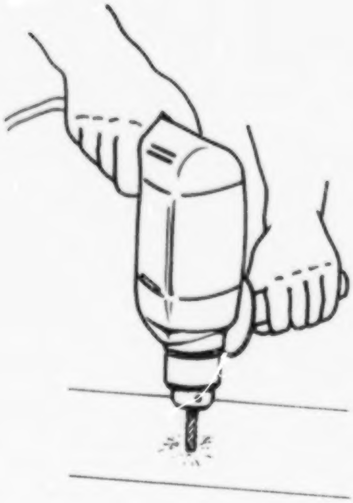


TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

PORTABLE DRILL

FOLLOW THESE STEPS:

STEP 9:	Hold the drill firmly with both hands and drill the hole. Use gentle pressure on the drill.
STEP 10:	When you have finished drilling, back the bit out of the hole while the drill is still on.
STEP 11:	Turn off the drill.
STEP 12:	Use a brush to remove shavings from work area.
STEP 13:	When you are finished with the demonstration, clean up work area and return tools to their proper places.



TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 8:
RADIAL ARM SAW

Developed by the
Curriculum and Instructional Materials Center
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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Demonstrate the safe operation of the Radial Arm Saw

❼ Complete Posttest

RADIAL ARM SAW

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- ♦ Gain factual information
- ♦ Make generalizations
- ♦ React to written material

Job Acquisition/Development Skills
- ♦ Master specific job task/procedure
- ♦ Develop good work habits/attitudes
- ♦ Develop self-confidence/esteem

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-16 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-16.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
    a. Pretest
    b. Posttest

GOAL

The Radial Arm Saw Safety Design Brief will help you learn how to use a radial arm saw safely and effectively.

OBJECTIVES

In this design brief, you will complete the following activities:

1. Complete the Posttest on Radial Arm Saw safety with a score of 100%.
2. Demonstrate safe use of the radial arm saw.

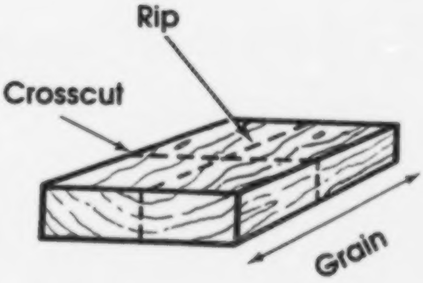
RADIAL ARM SAW

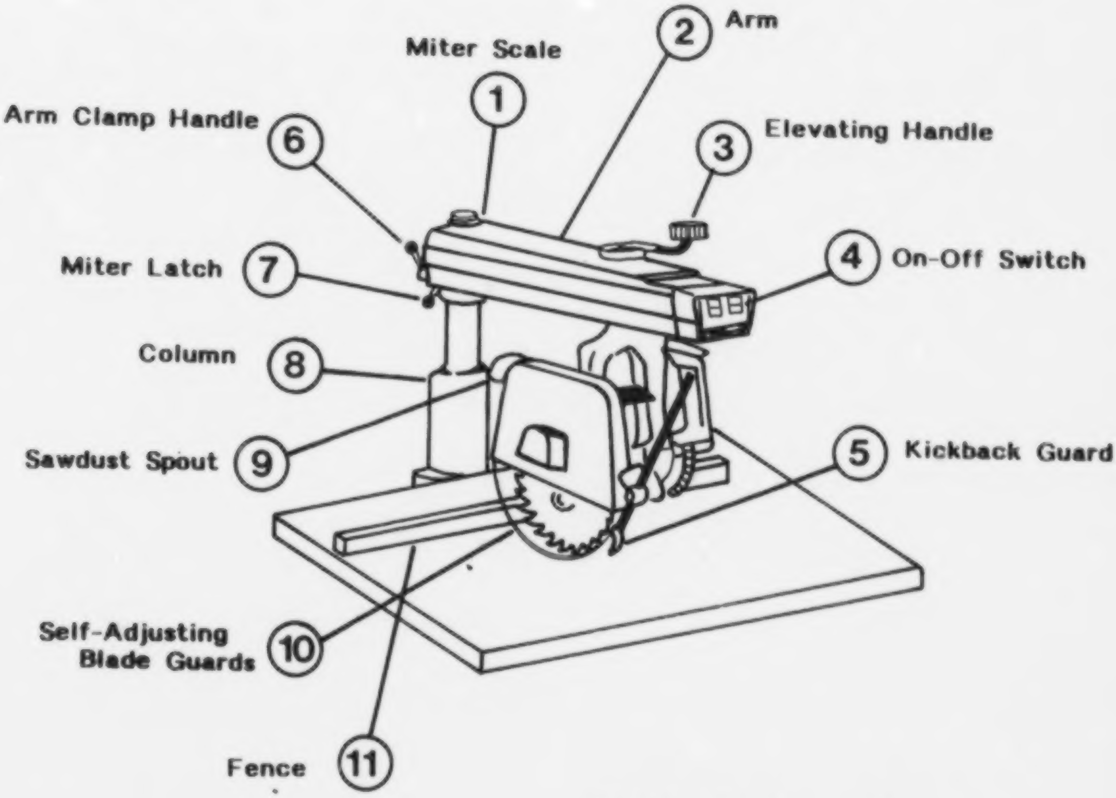
INTRODUCTION

The radial arm saw is used to crosscut and rip pieces of wood so they are the right size for your projects.

WORDS YOU SHOULD KNOW

Crosscut	to saw lumber at a right angle to the grain
Feed	to push lumber into the saw mechanism to be cut
Grain	the general direction of fibers in a piece of wood
Rip	to saw lumber parallel to the grain
Stock	lumber already cut to a standard size (such as a *2 by 4*)




1 Miter Scale
2 Arm
3 Elevating Handle
4 On-Off Switch
5 Kickback Guard
6 Arm Clamp Handle
7 Miter Latch
8 Column
9 Sawdust Spout
10 Self-Adjusting Blade Guards
11 Fence

Radial Arm Saw

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

SAFETY RULES

The following is a list of safety procedures for using the radial arm saw. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job remove ties, scarves, or jewelry, tie back long hair, and wear safety goggles
2. Use the proper blade for the job you are doing.
3. Use blades that are sharp and properly set.
4. Make sure the saw is set to the proper depth before turning on the machine.
5. Do not turn on the machine until all guards are in place.
6. Have your instructor check your setup before you turn on the machine.
7. Do not make any adjustments to the machine unless it is at a dead stop.
8. Stand to the right side of the saw blade and operate the saw with your left hand.
9. Keep your hands at least 6 inches away from the path of the saw blade.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

10. Make sure the saw has attained maximum speed before starting the cut.
11. Use the anti-kickback guard at all times.
12. Cut one piece of wood at a time.
13. Do not try to stop the blade by forcing scrap wood into the blade.
14. Do not feed or pull the saw too fast — you may jam the work.
15. When ripping, feed the stock against the direction of the blade rotation.
16. When crosscutting heavy stock, feed the saw slowly (it will tend to feed itself).
17. Return the blade to its position behind the guide fence after making each cut.
18. Do not remove the cut stock until you have returned the saw blade back to its starting position.
19. Remove wood scraps from the path of the blade with a brush or piece of wood after the blade is completely stopped.
20. Do not leave the saw until it has come to a complete stop.
21. **Never** use the saw unless your instructor is **with you.**

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

OBJECTIVE 1

Complete the Safety Test for the radial arm saw with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the radial arm saw. You **cannot** move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 17-32 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 17-32.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and retake the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Radial Arm Saw Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

OBJECTIVE 2

Demonstrate the safe operation of the Radial Arm Saw.

TOOLS AND MATERIALS

- ➢ Radial arm saw
- ➢ Safety glasses or goggles
- ➢ Wood stock
- ➢ Vise or clamps
- ➢ Brush or wood scrap

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Ask your instructor to show you a demonstration of how to properly operate the radial arm saw using the procedure described in this Design Brief.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

FOLLOW THESE STEPS:

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the radial arm saw, tell your instructor you are ready to demonstrate the proper operation of the radial arm saw.

WARNING

MOVING PARTS can catch hair, jewelry, and loose clothing. DRESS PROPERLY.

STEP 2: **Remove all jewelry, fasten long hair, and wear clothes that will not get caught in moving parts.**

WARNING

FLYING OBJECTS can injure eyes. WEAR SAFETY GLASSES OR GOGGLES.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

FOLLOW THESE STEPS:

STEP 3: Put on safety glasses or goggles.

WARNING

MOVING PARTS. Saw can cut off hand or fingers. KEEP SAW GUARDS IN PLACE.

STEP 4: Make sure saw guards are in place and working properly.

STEP 5: Before starting the saw, tighten all clamps and clear the area around saw so the radial arm swings freely.

STEP 6: Make sure the saw blades are sharp before operating the saw.

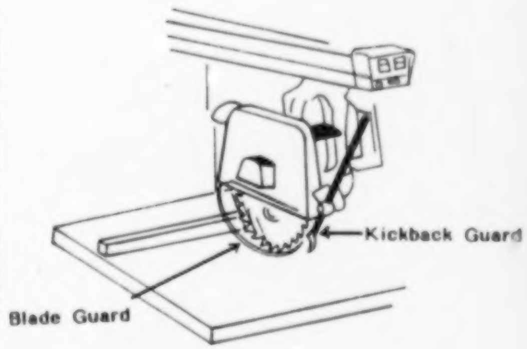
STEP 7: Lay wood stock flat on the saw table, checking that the material fits securely against the fence.

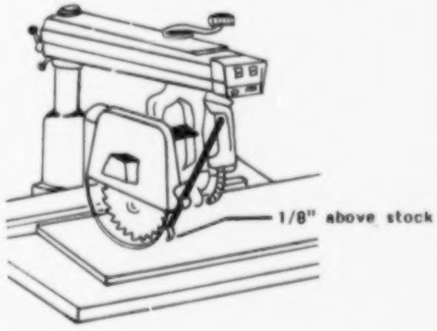
IMPORTANT

SET KICKBACK GUARD BEFORE TURNING ON SAW.

STEP 8: Set kickback guard ⅛ inch above stock.

RADIAL ARM SAW





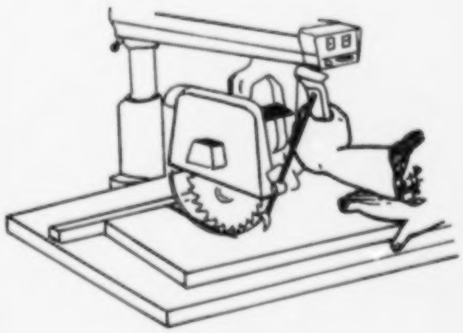
TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

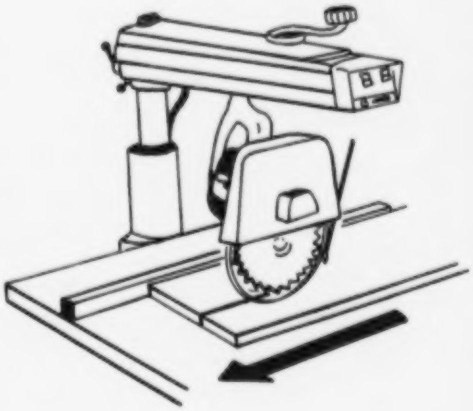
RADIAL ARM SAW

FOLLOW THESE STEPS:

IMPORTANT
Stand to one side with your hands clear of the saw's path when operating the saw.

STEP 9:	Turn on the saw. Saw the piece of wood as demonstrated by your instructor. Use your left hand to control the saw's radial arm.
STEP 10:	If guards need adjusting, ***turn off the saw***. Wait until the saw comes to a **complete stop**. Adjust the guards.
STEP 11:	Prepare to rip stock. When ripping stock, always work with another student.
STEP 12:	Tighten the rip lock before starting the saw. Always feed the stock from the infeed end of the saw guard; never from the kickback end. ***Make no exceptions to this rule.***
STEP 13:	Clear everything from the blade's path before starting the saw.
STEP 14:	Rip the stock, using the procedure demonstrated by your instructor.





TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

RADIAL ARM SAW

FOLLOW THESE STEPS:

STEP 15: After ripping, ***turn off the saw***. When the saw comes to a **complete stop**, use a piece of wood or a brush to remove scraps from the saw's path.

STEP 16: When you have finished, clean up your work area and return all tools and materials to their proper storage areas.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 9:
ROUTER

Developed by the
Curriculum and Instructional Materials Center
for the Technology Education Division
Oklahoma Department of Vocational and Technical Education

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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Complete Posttest

❼ Demonstrate safe use of the hand-held router

ROUTER

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- Gain factual information
- Make generalizations
- React to written material

Job Acquisition/Development Skills
- Master specific job task/procedure
- Develop good work habits/attitudes
- Develop self-confidence/esteem

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-10 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-10.

Get Pretest Questions from your instructor.

ROUTER

PRETEST

INSTRUCTIONS

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
    a. Pretest
    b. Posttest

GOAL

The Router Design Brief will help you learn how to use a router safely.

OBJECTIVES

In this Design Brief, you will complete the following acitvities:

1. Complete the Posttest on Router Safety with a score of 100%.
2. Demonstrate safe use of the hand-held router.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

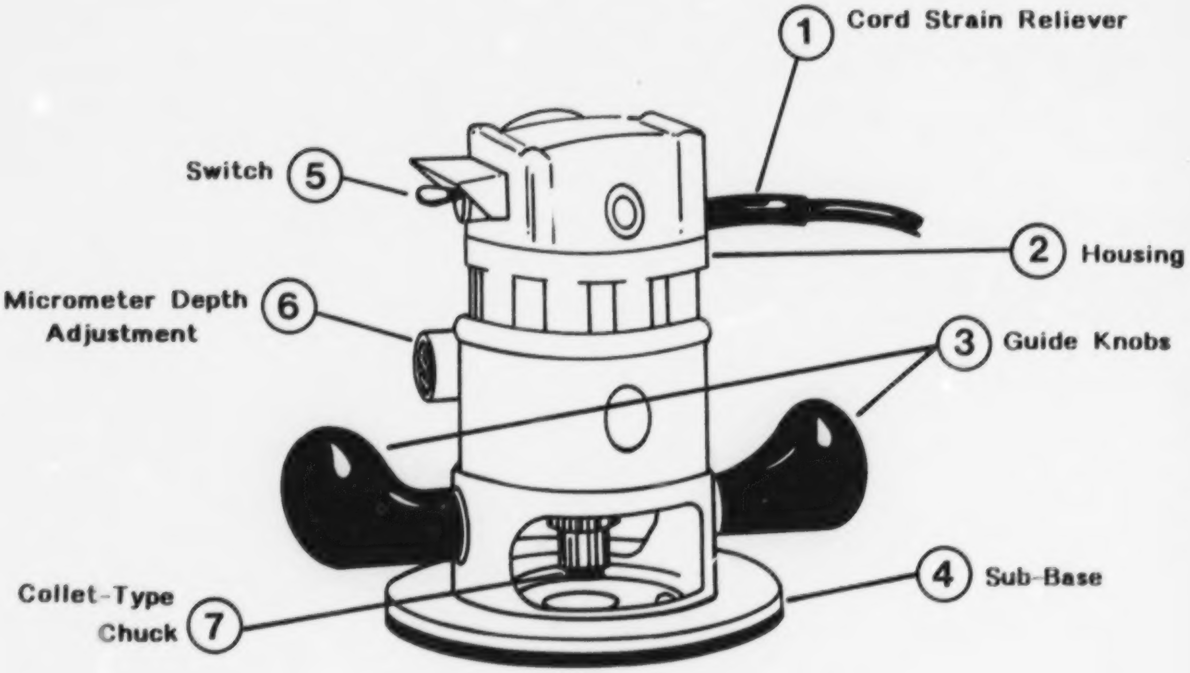
ROUTER

INTRODUCTION

The router is used to cut grooves, slots, and irregular shapes. It is often used in cabinetry to cut a decorative edge along the edges of boards.

WORDS YOU SHOULD KNOW

Stock	lumber already cut to standard sizes (such as a *2 by 4*)


1 Cord Strain Reliever
Switch 5
2 Housing
Micrometer Depth Adjustment 6
3 Guide Knobs
4 Sub-Base
Collet-Type Chuck 7

ROUTER

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

ROUTER

SAFETY RULES

The following is a list of safety procedures for using the router. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job remove ties, scarves, jewelry, or gloves, and keep long hair tied back.
2. Wear safety goggles at all times while using the router.
3. Make any adjustments only when the router is unplugged from the wall socket.
4. Make sure all bits and cutters are properly tightened.
5. Make sure the switch is off and the router is on its side before you plug in the power cord.
6. Fasten stock to work surface with clamps or vises.
7. Ask for your instructor's permission before turning the router ON.
8. Keep hands clear of revolving cutters.
9. Hold the router firmly by the guide knobs using both hands.
10. Feed the cutter slowly into the material.

11. When you finish a cut, turn off power and rest the machine on its side.
12. Disconnect power cord when finished.
13. Never use the router unless your instructor is with you.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

ROUTER

OBJECTIVE 1

Complete the Safety Test for the hand-held router with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the hand-held router. You cannot move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 11-20 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 11-20.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Router Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

ROUTER

OBJECTIVE 10

Demonstrate safe operation of the hand-held router.

TOOLS AND MATERIALS

- Hand-held router
- Wood stock
- Safety glasses or goggles

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Tell your instructor you are ready to see a demonstration of how to properly operate the hand-held router using the procedure described in this Design Brief.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

ROUTER

FOLLOW THESE STEPS:

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the hand-held router, tell your instructor you are ready to demonstrate the proper operation of the hand-held router.

WARNING

MOVING PARTS can catch hair, jewelry, and loose clothing. DRESS PROPERLY.

STEP 2: Wear proper clothing, remove jewelry, and fasten long hair.

WARNING

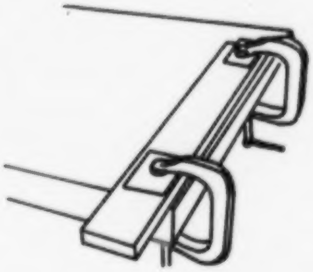
FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.

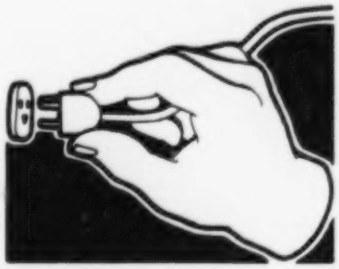
TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

ROUTER

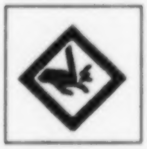
FOLLOW THESE STEPS:

STEP 3:	Wear safety glasses or goggles while operating machine.
STEP 4:	Fasten the stock to work surface with clamp or vise.
STEP 5:	Before adjusting router parts, unplug the power cord.
STEP 6:	Use the correct wrench to tighten all bits and cutters.
STEP 7:	Ask your instructor to approve set-up and adjustments.
STEP 8:	Turn the router power switch to OFF. Place the router on its side. Plug in the power cord.
STEP 9:	Grip the guide knobs on the router with both hands.
STEP 10:	Ask your instructor for permission before turning the router power switch to ON.



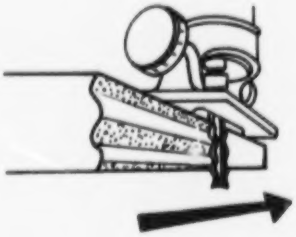


WARNING
ROTATING CUTTER can amputate fingers. KEEP HANDS AWAY.



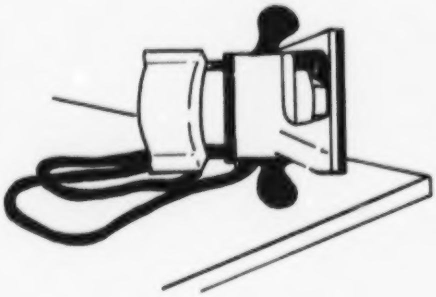
FOLLOW THESE STEPS:

STEP 11: Stand facing your work. As you feed the cutter slowly into the stock, rotate the router in a clockwise motion to get a more precise cut.



STEP 12: After cutting the stock, turn the power switch to OFF.

STEP 13: Place the router on its side with the cutter pointing away from you.



STEP 14: Unplug the power cord.

STEP 15: Clean the router and work area with a brush. Return the router, its parts, and tools to their proper storage areas.

TECHNOLOGY EDUCATION

SAFETY DESIGN BRIEFS

TE3107

DESIGN BRIEF 10:
TABLE SAW

Developed by the
Curriculum and Instructional Materials Center
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TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

In this Design Brief you will complete the following activities:

❶ Complete Pretest

❷ Read *Assignments to Turn In*

❸ Read *Goal*

❹ Read *Objectives*

❺ Read *Words You Should Know*

❻ Complete Posttest

❼ Demonstrate safe use of the table saw

TABLE SAW

SUMMARY OF ACTIVITIES

Reading Comprehension Skills
- Gain factual information
- Make generalizations
- React to written material

Job Acquisition/Development Skills
- Master specific job task/procedure
- Develop good work habits/attitudes
- Develop self-confidence/esteem

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

TABLE SAW

PRETEST

INSTRUCTIONS

You will need a computer scan sheet or card to record your answers to the following Pretest. Be sure to write your name, the title of the Design Brief, the date, and the class period on the computer scan sheet or card using a #2 pencil. Use rows 1-11 to record the answers to the Pretest. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 1-11.

Get Pretest Questions from your instructor.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

TABLE SAW

ASSIGNMENTS TO TURN IN

When you have completed this Design Brief, you should give the following items to your instructor for evaluation:

1. Computer score card/sheet with answers to:
    a. Pretest
    b. Posttest

GOAL

The Table Saw Design Brief will help you learn how to use a table saw safely.

OBJECTIVES

In this Design Brief, you will complete the following activities:

1. Complete the Posttest on Technology Lab Safety with a score of 100%.

2. Demonstrate safe use of the table saw.

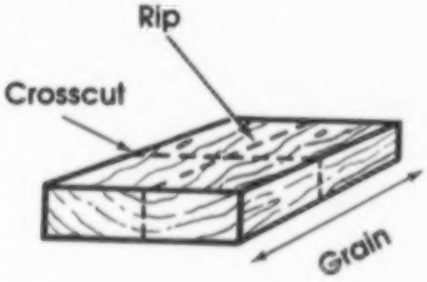
TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

TABLE SAW

INTRODUCTION

The table saw is used mainly for ripping lumber to the correct size for your projects. It may also be used to cross-cut lumber, bevel edges, and dado-cut with the permission of your instructor.

WORDS YOU SHOULD KNOW



Crosscut	to saw lumber at a right angle to the grain (across the grain)
Bevel	an angled edge
Dado cut	a groove cut into wood
Feed	to push lumber into the saw mechanism to be cut
Grain	the general direction of fibers in a piece of wood
Rip	to saw lumber parallel to the grain (with the grain)
Stock	lumber already cut to standard sizes (such as a *2 by 4*)

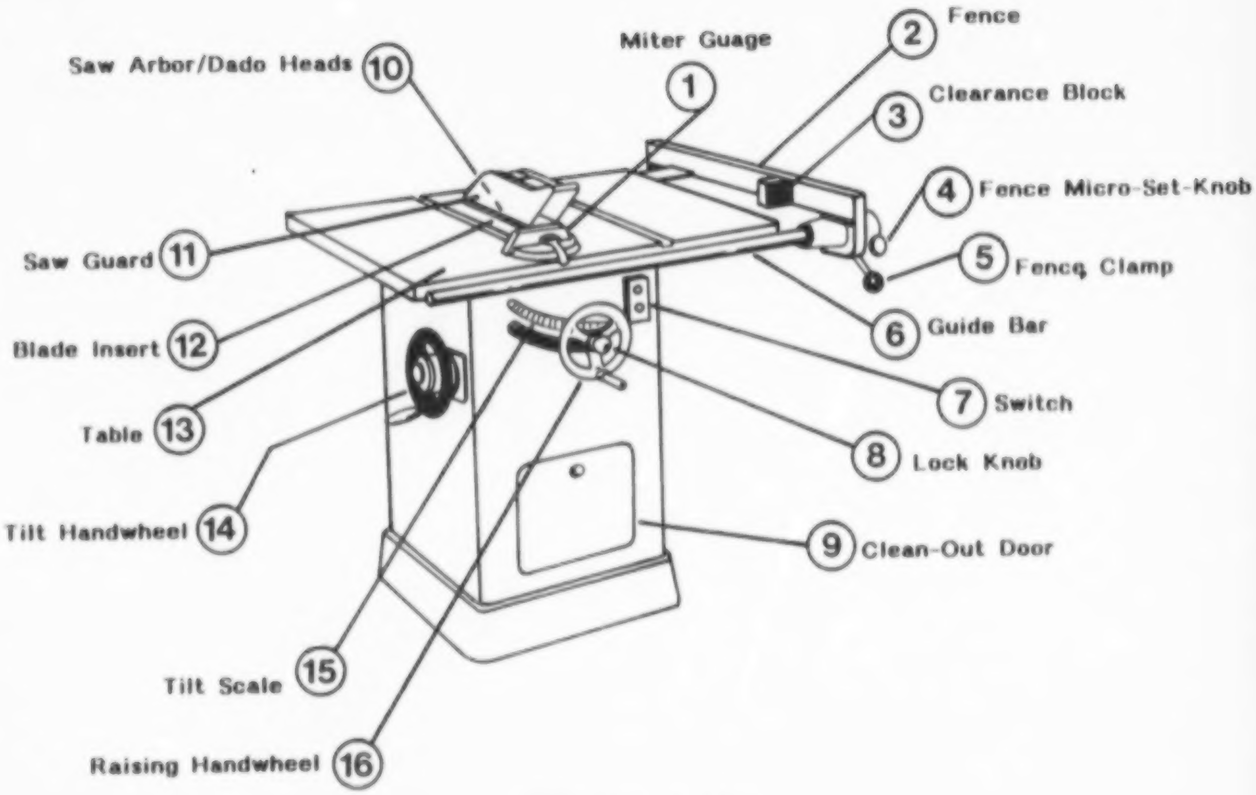

Saw Arbor/Dado Heads ⑩
Miter Guage ①
② Fence
③ Clearance Block
④ Fence Micro-Set-Knob
Saw Guard ⑪
⑤ Fence Clamp
Blade Insert ⑫
⑥ Guide Bar
⑦ Switch
Table ⑬
⑧ Lock Knob
Tilt Handwheel ⑭
⑨ Clean-Out Door
Tilt Scale ⑮
Raising Handwheel ⑯

TABLE SAW

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

TABLE SAW

SAFETY RULES

The following is a list of safety procedures for using the table saw. These safety rules are for your protection and should be followed at all times.

1. Make sure you are dressed correctly for the job remove ties, scarves, jewelry, or gloves, and keep long hair tied back.

2. Always wear safety goggles when operating the table saw.

3. Keep guards in place at all times while using the table saw.

2. Stand to the side of the saw during operation. Do not stand in line of the blade.

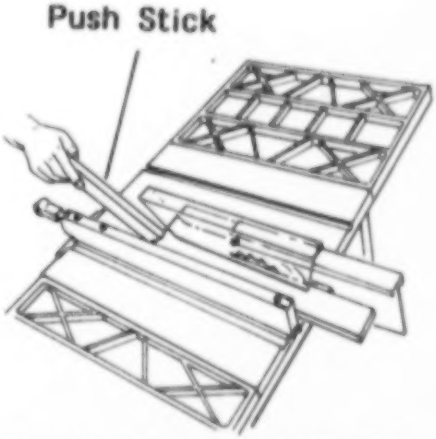
3. Do not raise the blade more than ⅛ inch above the wood's surface.

4. When you are cutting long stock, a helper should support the weight of the wood while the operator does the pushing.

5. Have your instructor inspect all special set-ups and dado heads.

6. Adjustments on the machine should be made with power off and the blade stopped.

7. Use a push stick when ripping narrow pieces of stock.



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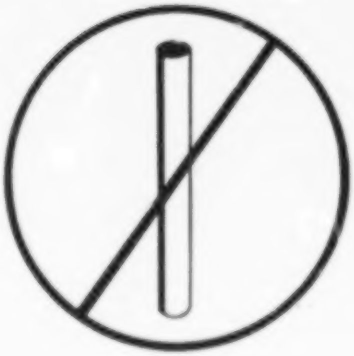
8. Do not rip without the rip fence or cross-cut without the miter gauge.
9. Make sure the saw blade is sharp, not cracked, and the right kind of blade.
10. Do not cut cylindrical (round) stock on a table saw.
11. Check for loose knots and cracks before ripping stock.
12. Hold the stock firmly when using a dado head.
13. Never use the table saw unless your instructor is with you.



TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

TABLE SAW

OBJECTIVE 11

Complete the Safety Test for the table saw with a score of 100%.

INSTRUCTIONS

For this objective you will complete the Safety Test for operation of the table saw. You **cannot** move to the next activity until you complete the test with a score of 100%.

You will need a computer score card or answer sheet to record your answers, and a #2 pencil. Use rows 12-22 on your computer score card to record your answers. If your answers will be hand-scored, use a blank sheet of notebook paper to record your answers and number your answers 12-22.

You have one class period to complete this test. You must score 100% to pass the test ... you cannot miss any questions! If you do miss a question, you must study the safety rules again and take the test on a new computer score card or blank sheet of paper.

Get Posttest Questions from your instructor.

You must pass the Table Saw Safety Test with a score of 100% before continuing the Design Brief activities.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

TABLE SAW

OBJECTIVE 12

Demonstrate safe operation of the table saw.

TOOLS AND MATERIALS

- Table saw
- Wood stock
- Safety glasses or goggles
- Face shield (optional)

PROCEDURE

FOLLOW THESE STEPS:

STEP 1: Tell instructor you are ready to see a demonstration of how to properly operate the table saw using the procedure described in this Design Brief activity.

IMPORTANT

Watch this demonstration carefully. If you are confused about any part of the demonstration, ask your instructor to show that part of the demonstration again. When you understand how to operate the table saw, tell your instructor you are ready to demonstrate the proper operation of the table saw.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

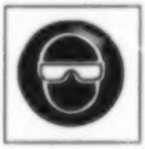
TABLE SAW

FOLLOW THESE STEPS:

WARNING
MOVING PARTS can catch hair, jewelry, and loose clothing. DRESS PROPERLY.

STEP 2: Make sure you are wearing proper clothing, remove jewelry, and tie back long hair.

WARNING
FLYING OBJECTS can put out eyes. WEAR SAFETY GLASSES OR GOGGLES.



STEP 3: Put on safety glasses or goggles. Wear a face shield if you are working in a dusty area.

TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

TABLE SAW

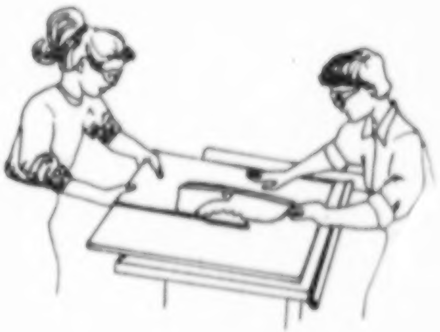
FOLLOW THESE STEPS:

WARNING
ROTATING BLADE can cut off hand or fingers. KEEP SAW GUARDS IN PLACE.

STEP 4: Make sure the saw blade is sharp and in good condition.

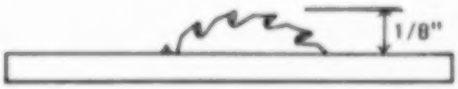
STEP 5: Make sure the guards are in place.

STEP 6: Make sure you have the correct fence for your cutting job (ripping fence to rip stock, sliding miter gauge to crosscut stock). If cutting a short piece of stock, fasten the clearance block to the fence for added protection.



STEP 7: Place the wood you intend to cut next to the blade. Get a push stick, if necessary. If you are cutting a large piece of stock, ask another student to help support the wood's weight.

STEP 8: Raise the blade until the top of the blade is ⅛ inch higher than the top surface of wood. Do not raise the blade above this height.



TECHNOLOGY EDUCATION SAFETY DESIGN BRIEFS

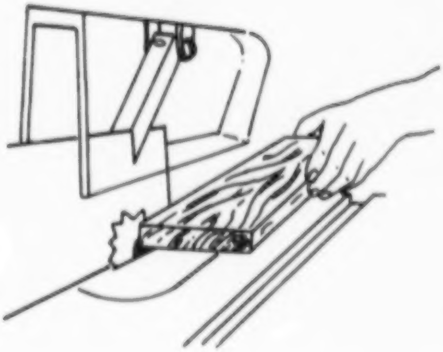
TABLE SAW

FOLLOW THESE STEPS:

STEP 9: Check that the blade's path is clear of any fences or set-ups.

STEP 10: Ask your instructor to approve your setup. **Do not** turn the machine on until your instructor has approved your setup.

STEP 11: Turn on the machine and stand to the left side of the saw. Stay on the left side of the while operating it. **Never stand directly behind the blade.**



WARNING
ROTATING BLADE can cut off hand or fingers. DO NOT PLACE HANDS DIRECTLY ABOVE SAW BLADE.

STEP 12: When the blade has reached full speed, feed the wood slowly through the saw. Make sure your hands are never directly above the saw blade. If you have a helper, make sure they are only supporting the wood's weight, not pushing or pulling the wood.

FOLLOW THESE STEPS:

STEP 13: Keep your work area clean and free of sawdust. Stop the blade completely before cleaning the area. Use a brush, not your hands, to clean the saw table.

STEP 14: After demonstrating safe operation of the table saw, clean up work area. Return all tools and materials to their proper storage areas.

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